Computer algebra independent integration tests

5-Inverse-trig-functions/5.4-Inverse-cotangent/5.4.1-Inverse-cotangent-functions

Nasser M. Abbasi

May 24, 2020 Compiled on May 24, 2020 at 10:53am

Contents

Chapter 1

Introduction

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

The number of integrals in this report is [234]. This is test number [154].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 100. (234)	% 0. (0)
Mathematica	% 97.86 (229)	% 2.14 (5)
Maple	% 97.44 (228)	% 2.56 (6)
Maxima	% 56.41 (132)	% 43.59 (102)
Fricas	% 71.79 (168)	% 28.21 (66)
Sympy	% 33.33 (78)	% 66.67 (156)
Giac	% 46.15 (108)	% 53.85 (126)

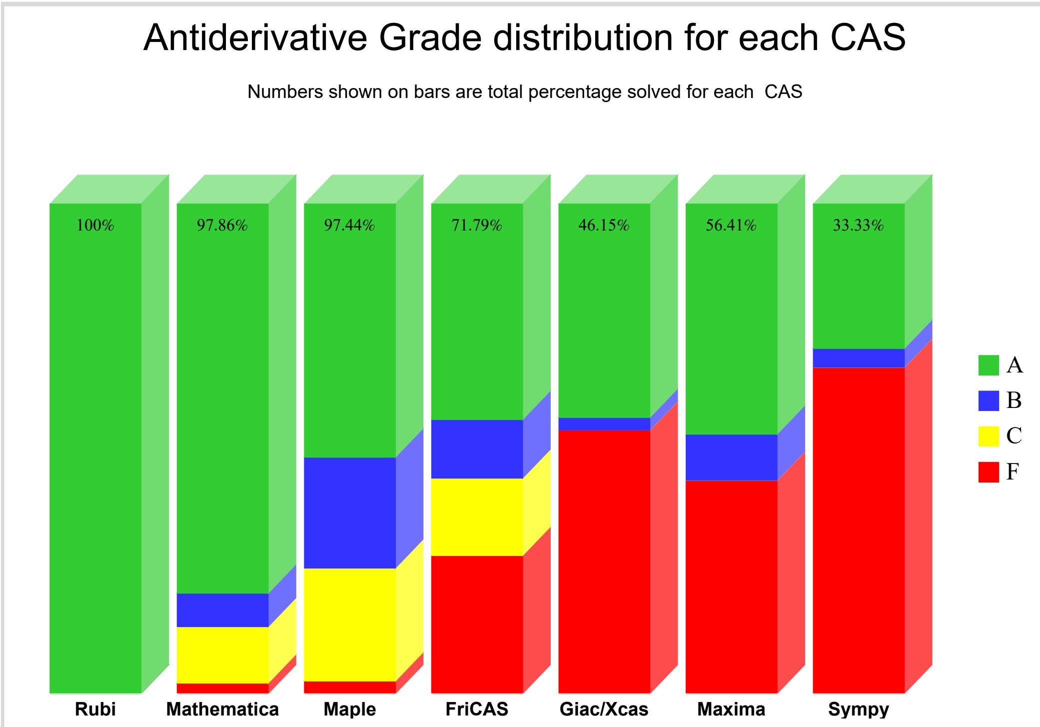
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives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

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

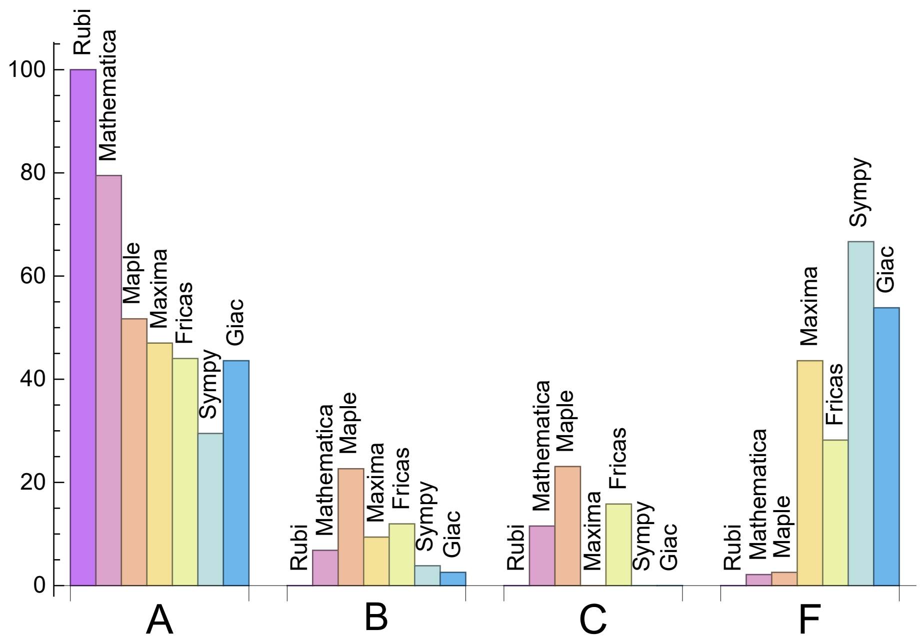
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Mathematica	79.49	6.84	11.54	2.14
Maple	51.71	22.65	23.08	2.56
Maxima	47.01	9.4	0.	43.59
Fricas	44.02	11.97	15.81	28.21
Sympy	29.49	3.85	0.	66.67
Giac	43.59	2.56	0.	53.85

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



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



1.3 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.23	133.07	0.88	91.	1.
Mathematica	0.92	191.38	1.37	95.	0.91
Maple	2.14	1094.64	5.04	147.5	1.4
Maxima	1.62	130.95	1.45	75.	1.27
Fricas	2.2	640.4	4.23	177.5	2.98
Sympy	4.76	139.38	1.63	39.	0.97
Giac	0.91	106.11	1.2	46.	1.29

1.4 list of integrals that has no closed form antiderivative

{34, 35, 59, 60, 116, 117, 120, 121, 128, 147, 148, 151, 155, 156, 161, 165, 169, 174, 178, 182, 187, 191, 195, 199, 204, 208, 212, 216}

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

Rubi {}

Mathematica {116, 117, 120, 121}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {107, 109, 110}

Mathematica {13, 15, 17, 18, 19, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 38, 40, 42, 44, 47, 48, 49, 50, 57, 58, 65, 66, 103, 107, 108, 109, 110, 113, 114, 115, 116, 117, 118, 119, 120, 121, 133, 136, 137, 138, 140, 141, 142, 143, 160, 164, 168, 173, 177, 181, 229, 230, 231, 232, 233, 234}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

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

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

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

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

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

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

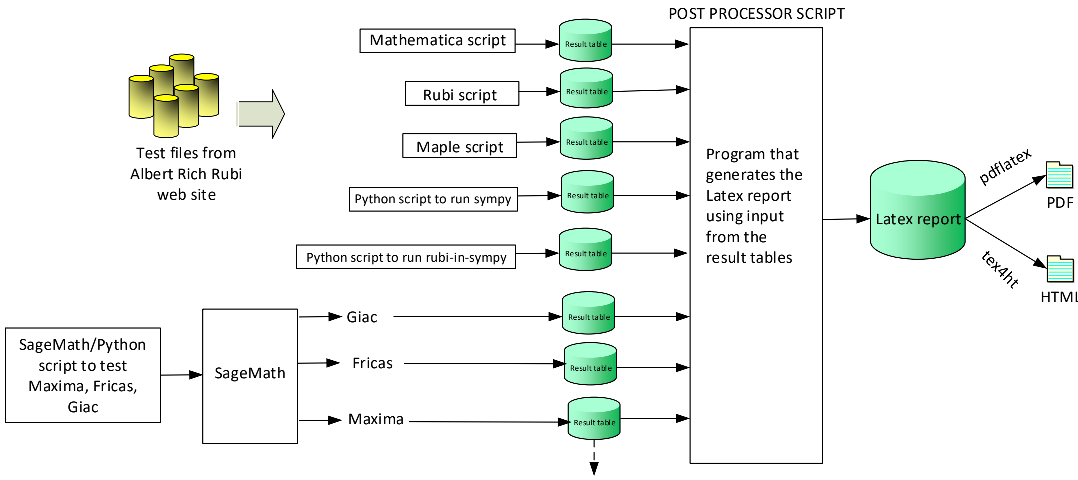
```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
         leafCount =1
```

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

1.10 Design of the test system

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



One record (line) per one integral result. The line is CSV comma separated. It contains 13 fields. This is description of each record (line)

1. integer, the problem number.
2. integer. 0 or 1 for failed or passed. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntx.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be “A”, “B”, “C”, or “F”
13. String. The optimal antiderivative in CAS own syntax.

High level overview of the CAS independent integration test build system

Nasser M. Abbasi
June 22, 2018

Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 41, 43, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 80, 81, 82, 83, 84, 85, 86, 87, 88, 91, 92, 93, 94, 95, 96, 97, 98, 102, 107, 109, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 124, 125, 126, 127, 128, 132, 133, 136, 137, 138, 140, 142, 143, 146, 147, 148, 149, 150, 151, 154, 155, 156, 157, 158, 159, 161, 162, 163, 165, 166, 167, 169, 170, 171, 172, 174, 175, 176, 178, 179, 180, 182, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 234 }

B grade: { 38, 40, 42, 46, 103, 108, 110, 141, 160, 164, 168, 173, 177, 181, 183, 200 }

C grade: { 9, 11, 44, 61, 62, 63, 64, 79, 89, 90, 99, 100, 101, 104, 105, 106, 123, 129, 130, 131, 134, 135, 217, 230, 231, 232, 233 }

F grade: { 139, 144, 145, 152, 153}

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 16, 20, 22, 23, 25, 27, 31, 33, 34, 35, 37, 39, 41, 43, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 59, 60, 65, 66, 70, 71, 72, 73, 74, 75, 76, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 99, 100, 101, 102, 103, 104, 105, 106, 108, 109, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 125, 128, 131, 132, 133, 134, 135, 145, 147, 148, 149, 151, 155, 156, 157, 161, 165, 169, 174, 178, 182, 187, 191, 195, 199, 204, 208, 212, 216, 219, 220, 224, 227, 228 }

B grade: { 7, 13, 15, 17, 19, 21, 28, 38, 40, 42, 44, 57, 58, 88, 97, 107, 113, 124, 126, 127, 129, 130, 136, 137, 138, 140, 141, 142, 143, 152, 153, 154, 160, 164, 168, 170, 173, 177, 181, 186, 190, 194, 198, 203, 207, 211, 215, 218, 221, 222, 223, 225, 226 }

C grade: { 18, 24, 26, 29, 30, 32, 67, 68, 69, 77, 98, 110, 111, 112, 139, 144, 150, 158, 159, 162, 163, 166, 167, 171, 172, 175, 176, 179, 180, 183, 184, 185, 188, 189, 192, 193, 196, 197, 200, 201, 202, 205, 206, 209, 210, 213, 214, 217, 229, 230, 231, 232, 233, 234 }

F grade: { 36, 61, 62, 63, 64, 146 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 16, 20, 22, 37, 39, 41, 43, 45, 46, 48, 50, 51, 53, 54, 55, 56, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 78, 79, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 99, 100, 101, 102, 103, 104, 105, 106, 109, 116, 117, 120, 121, 123, 125, 129, 130, 131, 132, 134, 135, 149, 150, 151, 155, 156, 157, 170, 187, 191, 192, 193, 194, 195, 196, 197, 198, 199, 204, 208, 209, 210, 211, 212, 213, 214, 215, 216, 218, 221, 224, 227, 228, 229, 230, 231, 232, 233, 234

B grade: { 7, 77, 80, 81, 82, 83, 84, 88, 98, 108, 122, 124, 126, 127, 160, 162, 163, 164, 166, 167, 168, 173 }

C grade: { }

F grade: { 13, 15, 17, 18, 19, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 40, 42, 44, 47, 49, 52, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 97, 107, 110, 111, 112, 113, 114, 115, 118, 119, 128, 133, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 152, 153, 154, 158, 159, 161, 165, 169, 171, 172, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 188, 189, 190, 200, 201, 202, 203, 205, 206, 207, 217, 219, 220, 222, 223, 225, 226 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 16, 20, 22, 34, 35, 37, 39, 41, 43, 45, 51, 52, 53, 54, 55, 56, 59, 60, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 78, 79, 82, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 99, 100, 101, 102, 104, 105, 106, 116, 117, 120, 121, 122, 123, 125, 129, 130, 131, 132, 134, 147, 148, 149, 150, 151, 155, 156, 157, 161, 165, 169, 170, 174, 177, 178, 181, 182, 187, 191, 195, 199, 204, 208, 212, 216, 224, 227, 228, 234 }

B grade: { 61, 62, 63, 64, 80, 81, 83, 84, 135, 160, 164, 168, 173, 186, 190, 194, 198, 203, 207, 211, 215, 218, 221, 229, 230, 231, 232, 233 }

C grade: { 158, 159, 162, 163, 166, 167, 171, 172, 175, 176, 179, 180, 183, 184, 185, 188, 189, 192, 193, 196, 197, 200, 201, 202, 205, 206, 209, 210, 213, 214, 217, 219, 220, 222, 223, 225, 226 }

F grade: { 7, 13, 15, 17, 18, 19, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 36, 38, 40, 42, 44, 46, 47, 48, 49, 50, 57, 58, 65, 66, 77, 88, 98, 103, 107, 108, 109, 110, 111, 112, 113, 114, 115, 118, 119, 124, 126, 127, 128, 133, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 152, 153, 154 }

2.1.6 Sympy

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 16, 20, 22, 34, 35, 37, 39, 41, 43, 45, 51, 52, 53, 54, 55, 56, 59, 60, 70, 74, 75, 76, 78, 79, 80, 81, 82, 83, 84, 92, 93, 94, 96, 99, 100, 101, 102, 116, 117, 120, 122, 123, 125, 128, 129, 130, 131, 132, 149, 151, 155, 156, 170, 187, 204, 227, 228 }

B grade: { 71, 89, 90, 91, 95, 104, 105, 106, 157 }

C grade: { }

F grade: { 7, 13, 15, 17, 18, 19, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 36, 38, 40, 42, 44, 46, 47, 48, 49, 50, 57, 58, 61, 62, 63, 64, 65, 66, 67, 68, 69, 72, 73, 77, 85, 86, 87, 88, 97, 98, 103, 107, 108, 109, 110, 111, 112, 113, 114, 115, 118, 119, 121, 124, 126, 127, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 150, 152, 153, 154, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 229, 230, 231, 232, 233, 234 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 16, 34, 35, 41, 51, 52, 53, 54, 55, 56, 59, 60, 61, 62, 63, 64, 67, 68, 69, 70, 71, 74, 75, 76, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 99, 100, 101, 102, 104, 105, 106, 116, 117, 120, 121, 122, 123, 125, 128, 132, 134, 147, 148, 149, 150, 151, 155, 156, 157, 161, 165, 169, 170, 174, 178, 182, 187, 191, 195, 199, 204, 208, 212, 216, 227, 228, 229, 230, 231, 232, 233, 234 }

B grade: { 37, 39, 129, 130, 131, 135 }

C grade: { }

F grade: { 7, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 36, 38, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 57, 58, 65, 66, 72, 73, 77, 88, 97, 98, 103, 107, 108, 109, 110, 111, 112, 113, 114, 115, 118, 119, 124, 126, 127, 133, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 152, 153, 154, 158, 159, 160, 162, 163, 164, 166, 167, 168, 171, 172, 173, 175, 176, 177, 179, 180, 181, 183, 184, 185, 186, 188, 189, 190, 192, 193, 194, 196, 197, 198, 200, 201, 202, 203, 205, 206, 207, 209, 210, 211, 213, 214, 215, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	51	51	51	42	63	100	48	74
normalized size	1	1.	1.	0.82	1.24	1.96	0.94	1.45
time (sec)	N/A	0.025	0.003	0.039	1.468	1.846	1.593	1.143

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	49	42	62	104	46	68
normalized size	1	1.	1.	0.86	1.27	2.12	0.94	1.39
time (sec)	N/A	0.036	0.012	0.04	0.975	1.856	1.196	1.081

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	41	34	51	78	39	61
normalized size	1	1.	1.	0.83	1.24	1.9	0.95	1.49
time (sec)	N/A	0.021	0.002	0.042	1.454	1.858	0.884	1.113

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	39	34	49	84	37	54
normalized size	1	1.	1.	0.87	1.26	2.15	0.95	1.38
time (sec)	N/A	0.026	0.01	0.039	0.989	1.922	0.638	1.137

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	31	31	31	26	38	58	31	43
normalized size	1	1.	1.	0.84	1.23	1.87	1.	1.39
time (sec)	N/A	0.012	0.002	0.039	1.49	1.905	0.413	1.115

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	24	24	24	23	32	62	24	35
normalized size	1	1.	1.	0.96	1.33	2.58	1.	1.46
time (sec)	N/A	0.006	0.003	0.036	0.972	2.026	0.258	1.122

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	37	63	89	0	0	0
normalized size	1	1.	1.	1.7	2.41	0.	0.	0.
time (sec)	N/A	0.025	0.003	0.049	1.626	0.	0.	0.

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	30	30	30	31	41	82	24	46
normalized size	1	1.	1.	1.03	1.37	2.73	0.8	1.53
time (sec)	N/A	0.018	0.002	0.043	0.967	1.913	0.345	1.093

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	31	31	36	26	31	58	24	36
normalized size	1	1.	1.16	0.84	1.	1.87	0.77	1.16
time (sec)	N/A	0.015	0.002	0.043	1.501	1.875	0.631	1.11

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	46	46	44	41	57	105	39	73
normalized size	1	1.	0.96	0.89	1.24	2.28	0.85	1.59
time (sec)	N/A	0.027	0.011	0.044	0.981	1.995	0.87	1.125

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	36	34	50	80	32	55
normalized size	1	1.	0.88	0.83	1.22	1.95	0.78	1.34
time (sec)	N/A	0.018	0.003	0.046	1.484	1.864	1.018	1.123

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	104	79	102	128	189	104	190
normalized size	1	1.	0.76	0.98	1.23	1.82	1.	1.83
time (sec)	N/A	0.221	0.023	0.049	1.523	1.989	2.48	1.119

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	135	135	95	233	0	0	0	0
normalized size	1	1.	0.7	1.73	0.	0.	0.	0.
time (sec)	N/A	0.211	0.501	0.121	0.	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	61	82	104	144	78	146
normalized size	1	1.	0.76	1.02	1.3	1.8	0.98	1.82
time (sec)	N/A	0.146	0.02	0.051	1.543	1.917	1.327	1.137

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	111	111	76	213	0	0	0	0
normalized size	1	1.	0.68	1.92	0.	0.	0.	0.
time (sec)	N/A	0.14	0.263	0.112	0.	0.	0.	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	42	61	77	105	54	101
normalized size	1	1.	0.79	1.15	1.45	1.98	1.02	1.91
time (sec)	N/A	0.072	0.013	0.048	1.537	1.749	0.646	1.122

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	67	67	56	136	0	0	0	0
normalized size	1	1.	0.84	2.03	0.	0.	0.	0.
time (sec)	N/A	0.074	0.076	0.164	0.	0.	0.	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	116	116	132	959	0	0	0	0
normalized size	1	1.	1.14	8.27	0.	0.	0.	0.
time (sec)	N/A	0.213	0.06	0.601	0.	0.	0.	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	66	66	64	234	0	0	0	0
normalized size	1	1.	0.97	3.55	0.	0.	0.	0.
time (sec)	N/A	0.105	0.044	0.138	0.	0.	0.	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	56	68	76	143	53	0
normalized size	1	1.	0.95	1.15	1.29	2.42	0.9	0.
time (sec)	N/A	0.088	0.017	0.052	1.473	2.027	0.695	0.

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	113	113	96	290	0	0	0	0
normalized size	1	1.	0.85	2.57	0.	0.	0.	0.
time (sec)	N/A	0.161	0.232	0.133	0.	0.	0.	0.

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	81	91	128	181	80	0
normalized size	1	1.	0.91	1.02	1.44	2.03	0.9	0.
time (sec)	N/A	0.155	0.02	0.058	1.526	1.88	1.197	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	194	194	125	243	0	0	0	0
normalized size	1	1.	0.64	1.25	0.	0.	0.	0.
time (sec)	N/A	0.667	0.601	0.531	0.	0.	0.	0.

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	205	205	184	2731	0	0	0	0
normalized size	1	1.	0.9	13.32	0.	0.	0.	0.
time (sec)	N/A	0.517	0.586	3.753	0.	0.	0.	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	148	148	96	209	0	0	0	0
normalized size	1	1.	0.65	1.41	0.	0.	0.	0.
time (sec)	N/A	0.386	0.333	0.451	0.	0.	0.	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	157	157	149	1815	0	0	0	0
normalized size	1	1.	0.95	11.56	0.	0.	0.	0.
time (sec)	N/A	0.302	0.324	1.355	0.	0.	0.	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	103	103	76	162	0	0	0	0
normalized size	1	1.	0.74	1.57	0.	0.	0.	0.
time (sec)	N/A	0.171	0.086	0.316	0.	0.	0.	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	96	96	90	199	0	0	0	0
normalized size	1	1.	0.94	2.07	0.	0.	0.	0.
time (sec)	N/A	0.15	0.104	0.163	0.	0.	0.	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	178	178	180	1050	0	0	0	0
normalized size	1	1.	1.01	5.9	0.	0.	0.	0.
time (sec)	N/A	0.327	0.076	0.412	0.	0.	0.	0.

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	93	93	83	1576	0	0	0	0
normalized size	1	1.	0.89	16.95	0.	0.	0.	0.
time (sec)	N/A	0.188	0.072	0.574	0.	0.	0.	0.

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	105	105	90	109	0	0	0	0
normalized size	1	1.	0.86	1.04	0.	0.	0.	0.
time (sec)	N/A	0.199	0.16	0.322	0.	0.	0.	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	167	167	151	5029	0	0	0	0
normalized size	1	1.	0.9	30.11	0.	0.	0.	0.
time (sec)	N/A	0.337	0.244	1.627	0.	0.	0.	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	152	152	126	158	0	0	0	0
normalized size	1	1.	0.83	1.04	0.	0.	0.	0.
time (sec)	N/A	0.42	0.258	0.485	0.	0.	0.	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.013	0.828	1.293	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	12	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.013	0.815	0.956	0.	0.	0.	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	52	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.02	0.02	1.026	0.	0.	0.	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	40	40	32	38	47	100	34	90
normalized size	1	1.	0.8	0.95	1.18	2.5	0.85	2.25
time (sec)	N/A	0.097	0.027	0.029	1.479	1.999	0.711	1.137

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	67	67	241	128	0	0	0	0
normalized size	1	1.	3.6	1.91	0.	0.	0.	0.
time (sec)	N/A	0.093	0.059	0.114	0.	0.	0.	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	23	23	23	26	32	68	19	58
normalized size	1	1.	1.	1.13	1.39	2.96	0.83	2.52
time (sec)	N/A	0.048	0.013	0.03	1.541	1.867	0.389	1.124

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	48	48	221	114	0	0	0	0
normalized size	1	1.	4.6	2.38	0.	0.	0.	0.
time (sec)	N/A	0.054	0.047	0.104	0.	0.	0.	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	8	8	8	7	8	24	7	11
normalized size	1	1.	1.	0.88	1.	3.	0.88	1.38
time (sec)	N/A	0.012	0.003	0.02	0.978	1.922	0.695	1.108

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	49	49	251	163	0	0	0	0
normalized size	1	1.	5.12	3.33	0.	0.	0.	0.
time (sec)	N/A	0.073	0.06	0.115	0.	0.	0.	0.

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	30	30	30	33	39	90	22	0
normalized size	1	1.	1.	1.1	1.3	3.	0.73	0.
time (sec)	N/A	0.056	0.016	0.033	1.507	1.944	0.654	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	72	72	280	180	0	0	0	0
normalized size	1	1.	3.89	2.5	0.	0.	0.	0.
time (sec)	N/A	0.115	0.063	0.115	0.	0.	0.	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	47	43	74	130	42	0
normalized size	1	1.	1.	0.91	1.57	2.77	0.89	0.
time (sec)	N/A	0.109	0.02	0.039	1.479	1.957	1.875	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	206	206	626	265	269	0	0	0
normalized size	1	1.	3.04	1.29	1.31	0.	0.	0.
time (sec)	N/A	0.58	1.585	0.247	1.588	0.	0.	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	188	188	343	284	0	0	0	0
normalized size	1	1.	1.82	1.51	0.	0.	0.	0.
time (sec)	N/A	0.184	0.083	0.174	0.	0.	0.	0.

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	183	183	319	304	266	0	0	0
normalized size	1	1.	1.74	1.66	1.45	0.	0.	0.
time (sec)	N/A	0.465	0.078	0.184	1.596	0.	0.	0.

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	223	223	379	345	0	0	0	0
normalized size	1	1.	1.7	1.55	0.	0.	0.	0.
time (sec)	N/A	0.247	0.091	0.149	0.	0.	0.	0.

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	212	212	348	271	261	0	0	0
normalized size	1	1.	1.64	1.28	1.23	0.	0.	0.
time (sec)	N/A	0.503	0.085	0.207	1.549	0.	0.	0.

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	5	5	5	6	7	23	5	11
normalized size	1	1.	1.	1.2	1.4	4.6	1.	2.2
time (sec)	N/A	0.02	0.023	0.019	0.947	1.769	0.345	1.095

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	13	13	13	14	0	43	17	20
normalized size	1	1.	1.	1.08	0.	3.31	1.31	1.54
time (sec)	N/A	0.024	0.007	0.038	0.	1.999	4.601	1.09

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	244	244	212	279	305	540	367	320
normalized size	1	1.	0.87	1.14	1.25	2.21	1.5	1.31
time (sec)	N/A	0.176	0.162	0.044	1.003	1.91	6.184	1.12

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	149	191	215	366	243	221
normalized size	1	1.	0.89	1.14	1.28	2.18	1.45	1.32
time (sec)	N/A	0.12	0.104	0.043	0.972	1.838	3.536	1.131

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	97	119	139	240	151	142
normalized size	1	1.	0.89	1.09	1.28	2.2	1.39	1.3
time (sec)	N/A	0.127	0.066	0.042	1.013	1.923	1.935	1.116

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	58	58	67	60	72	127	73	74
normalized size	1	1.	1.16	1.03	1.24	2.19	1.26	1.28
time (sec)	N/A	0.061	0.009	0.04	0.953	2.147	0.836	1.104

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	403	403	523	826	0	0	0	0
normalized size	1	1.	1.3	2.05	0.	0.	0.	0.
time (sec)	N/A	0.919	0.293	0.264	0.	0.	0.	0.

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	801	801	802	2177	0	0	0	0
normalized size	1	1.	1.	2.72	0.	0.	0.	0.
time (sec)	N/A	1.158	7.306	0.447	0.	0.	0.	0.

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.019	5.408	0.954	0.	0.	0.	0.

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	18	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.022	3.74	0.858	0.	0.	0.	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	B	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	169	0	0	729	0	80
normalized size	1	1.	2.56	0.	0.	11.05	0.	1.21
time (sec)	N/A	0.094	0.227	0.644	0.	2.329	0.	1.144

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	B	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	262	0	0	1450	0	170
normalized size	1	1.	1.96	0.	0.	10.82	0.	1.27
time (sec)	N/A	0.326	0.607	0.665	0.	2.82	0.	1.175

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	345	0	0	2569	0	281
normalized size	1	1.	1.66	0.	0.	12.35	0.	1.35
time (sec)	N/A	0.935	0.938	0.891	0.	3.581	0.	1.217

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	B	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	293	450	0	0	4097	0	459
normalized size	1	1.	1.54	0.	0.	13.98	0.	1.57
time (sec)	N/A	1.155	1.395	0.725	0.	7.702	0.	1.23

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	195	195	136	117	0	0	0	0
normalized size	1	1.	0.7	0.6	0.	0.	0.	0.
time (sec)	N/A	0.072	1.114	0.7	0.	0.	0.	0.

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	155	155	89	99	0	0	0	0
normalized size	1	1.	0.57	0.64	0.	0.	0.	0.
time (sec)	N/A	0.045	0.103	0.57	0.	0.	0.	0.

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	21	68	42	69	0	45
normalized size	1	1.	0.6	1.94	1.2	1.97	0.	1.29
time (sec)	N/A	0.02	0.023	0.381	1.469	2.118	0.	1.144

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	37	165	85	122	0	74
normalized size	1	1.	0.47	2.09	1.08	1.54	0.	0.94
time (sec)	N/A	0.044	0.031	0.386	1.456	2.203	0.	1.148

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	118	47	289	126	174	0	112
normalized size	1	1.	0.4	2.45	1.07	1.47	0.	0.95
time (sec)	N/A	0.067	0.038	0.455	1.539	2.192	0.	1.145

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	32	32	25	27	35	55	31	38
normalized size	1	1.	0.78	0.84	1.09	1.72	0.97	1.19
time (sec)	N/A	0.026	0.018	0.026	1.487	2.145	0.707	1.102

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	36	37	53	96	88	49
normalized size	1	1.	0.82	0.84	1.2	2.18	2.	1.11
time (sec)	N/A	0.029	0.021	0.025	1.472	2.102	1.204	1.112

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	28	35	51	81	0	0
normalized size	1	1.	0.82	1.03	1.5	2.38	0.	0.
time (sec)	N/A	0.015	0.013	0.034	1.464	2.151	0.	0.

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	56	56	46	61	101	123	0	0
normalized size	1	1.	0.82	1.09	1.8	2.2	0.	0.
time (sec)	N/A	0.044	0.024	0.169	1.525	2.082	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	41	36	51	88	39	54
normalized size	1	1.	1.	0.88	1.24	2.15	0.95	1.32
time (sec)	N/A	0.025	0.014	0.045	0.975	2.16	2.94	1.106

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	37	32	46	63	36	49
normalized size	1	1.	1.	0.86	1.24	1.7	0.97	1.32
time (sec)	N/A	0.019	0.006	0.04	1.443	2.108	1.485	1.126

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	31	31	31	28	38	68	31	39
normalized size	1	1.	1.	0.9	1.23	2.19	1.	1.26
time (sec)	N/A	0.009	0.006	0.039	0.994	2.21	0.839	1.091

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	37	57	108	0	0	0
normalized size	1	1.	1.	1.54	2.92	0.	0.	0.
time (sec)	N/A	0.034	0.006	0.117	1.614	0.	0.	0.

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	34	31	43	93	29	46
normalized size	1	1.	1.	0.91	1.26	2.74	0.85	1.35
time (sec)	N/A	0.017	0.006	0.048	0.966	2.291	1.054	1.143

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	38	30	36	63	29	39
normalized size	1	1.	1.09	0.86	1.03	1.8	0.83	1.11
time (sec)	N/A	0.018	0.006	0.044	1.463	2.127	1.733	1.122

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	136	129	362	757	1086	211
normalized size	1	1.	0.89	0.85	2.38	4.98	7.14	1.39
time (sec)	N/A	0.104	0.041	0.061	1.455	2.369	58.118	1.14

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	133	127	342	713	1081	207
normalized size	1	1.	0.89	0.85	2.28	4.75	7.21	1.38
time (sec)	N/A	0.094	0.027	0.043	1.502	2.301	30.421	1.12

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	132	132	102	118	339	647	440	194
normalized size	1	1.	0.77	0.89	2.57	4.9	3.33	1.47
time (sec)	N/A	0.076	0.034	0.041	1.511	2.25	14.902	1.097

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	105	115	327	633	462	182
normalized size	1	1.	0.78	0.85	2.42	4.69	3.42	1.35
time (sec)	N/A	0.079	0.04	0.042	1.492	2.313	30.065	1.129

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	146	121	356	706	1074	189
normalized size	1	1.	0.97	0.81	2.37	4.71	7.16	1.26
time (sec)	N/A	0.092	0.051	0.043	1.476	2.34	55.366	1.109

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	51	51	40	32	42	88	0	42
normalized size	1	1.	0.78	0.63	0.82	1.73	0.	0.82
time (sec)	N/A	0.012	0.015	0.023	1.456	2.229	0.	1.105

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	33	27	35	72	0	35
normalized size	1	1.	0.79	0.64	0.83	1.71	0.	0.83
time (sec)	N/A	0.009	0.011	0.022	1.424	2.28	0.	1.091

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	22	22	22	17	22	47	0	22
normalized size	1	1.	1.	0.77	1.	2.14	0.	1.
time (sec)	N/A	0.006	0.006	0.023	1.454	2.212	0.	1.108

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	31	31	31	61	47	0	0	0
normalized size	1	1.	1.	1.97	1.52	0.	0.	0.
time (sec)	N/A	0.032	0.005	0.033	1.583	0.	0.	0.

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	23	23	29	18	23	54	92	26
normalized size	1	1.	1.26	0.78	1.	2.35	4.	1.13
time (sec)	N/A	0.011	0.009	0.024	1.466	2.269	3.079	1.101

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	34	27	35	80	160	35
normalized size	1	1.	0.81	0.64	0.83	1.9	3.81	0.83
time (sec)	N/A	0.012	0.01	0.029	1.463	2.188	8.744	1.108

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	36	36	29	25	32	88	85	32
normalized size	1	1.	0.81	0.69	0.89	2.44	2.36	0.89
time (sec)	N/A	0.014	0.016	0.023	0.974	2.209	7.887	1.096

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	29	29	25	20	26	73	24	26
normalized size	1	1.	0.86	0.69	0.9	2.52	0.83	0.9
time (sec)	N/A	0.011	0.011	0.023	0.973	2.189	1.332	1.107

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	19	54	17	19
normalized size	1	1.	1.	0.83	1.06	3.	0.94	1.06
time (sec)	N/A	0.007	0.007	0.023	0.955	2.208	0.45	1.093

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	22	22	22	19	24	77	20	22
normalized size	1	1.	1.	0.86	1.09	3.5	0.91	1.
time (sec)	N/A	0.008	0.012	0.027	0.979	2.136	1.766	1.128

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	29	26	34	97	143	38
normalized size	1	1.	0.78	0.7	0.92	2.62	3.86	1.03
time (sec)	N/A	0.012	0.018	0.029	1.006	2.262	8.517	1.129

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	20	20	46	14	18
normalized size	1	1.	1.	1.18	1.18	2.71	0.82	1.06
time (sec)	N/A	0.006	0.002	0.049	0.992	2.075	0.191	1.099

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	40	94	0	181	0	0
normalized size	1	1.	0.85	2.	0.	3.85	0.	0.
time (sec)	N/A	0.035	0.015	0.052	0.	2.321	0.	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	37	57	108	0	0	0
normalized size	1	1.	1.	1.54	2.92	0.	0.	0.
time (sec)	N/A	0.034	0.007	0.116	1.629	0.	0.	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	95	132	140	225	155	142
normalized size	1	1.	0.9	1.25	1.32	2.12	1.46	1.34
time (sec)	N/A	0.107	0.067	0.052	1.445	2.227	4.025	1.127

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	80	114	94	115	184	117	113
normalized size	1	1.	1.42	1.18	1.44	2.3	1.46	1.41
time (sec)	N/A	0.078	0.042	0.041	1.475	2.208	1.309	1.12

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	90	66	92	143	78	84
normalized size	1	1.	1.5	1.1	1.53	2.38	1.3	1.4
time (sec)	N/A	0.055	0.033	0.044	1.474	2.273	0.833	1.093

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	33	33	44	36	39	119	46	68
normalized size	1	1.	1.33	1.09	1.18	3.61	1.39	2.06
time (sec)	N/A	0.012	0.013	0.039	0.956	2.146	0.488	1.118

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	120	120	251	103	180	0	0	0
normalized size	1	1.	2.09	0.86	1.5	0.	0.	0.
time (sec)	N/A	0.108	0.025	0.056	1.65	0.	0.	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	66	63	104	174	330	97
normalized size	1	1.	1.06	1.02	1.68	2.81	5.32	1.56
time (sec)	N/A	0.039	0.052	0.049	1.478	2.316	9.504	1.111

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	92	104	151	248	675	158
normalized size	1	1.	0.97	1.09	1.59	2.61	7.11	1.66
time (sec)	N/A	0.082	0.093	0.048	1.474	2.305	15.208	1.114

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	126	164	223	344	1125	242
normalized size	1	1.	0.98	1.27	1.73	2.67	8.72	1.88
time (sec)	N/A	0.112	0.132	0.053	1.489	2.403	33.039	1.134

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD
size	642	655	563	2082	0	0	0	0
normalized size	1	1.02	0.88	3.24	0.	0.	0.	0.
time (sec)	N/A	0.998	0.549	0.814	0.	0.	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	B	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	152	152	345	198	382	0	0	0
normalized size	1	1.	2.27	1.3	2.51	0.	0.	0.
time (sec)	N/A	0.142	0.04	0.057	1.896	0.	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD
size	338	422	602	317	378	0	0	0
normalized size	1	1.25	1.78	0.94	1.12	0.	0.	0.
time (sec)	N/A	0.498	9.245	0.066	1.879	0.	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F(-2)	F	F(-1)	F
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD
size	735	818	5117	52954	0	0	0	0
normalized size	1	1.11	6.96	72.05	0.	0.	0.	0.
time (sec)	N/A	1.518	33.893	1.987	0.	0.	0.	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	693	693	618	343	0	0	0	0
normalized size	1	1.	0.89	0.49	0.	0.	0.	0.
time (sec)	N/A	2.065	0.736	0.231	0.	0.	0.	0.

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	830	830	809	376	0	0	0	0
normalized size	1	1.	0.97	0.45	0.	0.	0.	0.
time (sec)	N/A	2.322	0.686	0.214	0.	0.	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	367	367	629	4601	0	0	0	0
normalized size	1	1.	1.71	12.54	0.	0.	0.	0.
time (sec)	N/A	0.686	0.455	1.072	0.	0.	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	132	132	127	123	0	0	0	0
normalized size	1	1.	0.96	0.93	0.	0.	0.	0.
time (sec)	N/A	0.096	0.144	0.429	0.	0.	0.	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	216	216	138	156	0	0	0	0
normalized size	1	1.	0.64	0.72	0.	0.	0.	0.
time (sec)	N/A	0.168	0.077	0.518	0.	0.	0.	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	22	0	177	0	0	0	0	0
normalized size	1	0.	8.05	0.	0.	0.	0.	0.
time (sec)	N/A	0.04	0.379	1.135	0.	0.	0.	0.

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	24	0	180	0	0	0	0	0
normalized size	1	0.	7.5	0.	0.	0.	0.	0.
time (sec)	N/A	0.053	0.085	1.108	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	187	187	202	167	0	0	0	0
normalized size	1	1.	1.08	0.89	0.	0.	0.	0.
time (sec)	N/A	0.223	1.444	0.642	0.	0.	0.	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	281	281	207	202	0	0	0	0
normalized size	1	1.	0.74	0.72	0.	0.	0.	0.
time (sec)	N/A	0.349	0.901	1.1	0.	0.	0.	0.

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	29	0	198	0	0	0	0	0
normalized size	1	0.	6.83	0.	0.	0.	0.	0.
time (sec)	N/A	0.137	0.92	1.473	0.	0.	0.	0.

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	31	0	200	0	0	0	0	0
normalized size	1	0.	6.45	0.	0.	0.	0.	0.
time (sec)	N/A	0.19	0.205	1.456	0.	0.	0.	0.

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	52	52	42	86	126	192	100	86
normalized size	1	1.	0.81	1.65	2.42	3.69	1.92	1.65
time (sec)	N/A	0.039	0.014	0.042	1.472	2.186	1.671	1.1

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	141	57	70	82	56	54
normalized size	1	1.	3.62	1.46	1.79	2.1	1.44	1.38
time (sec)	N/A	0.021	0.055	0.043	1.452	2.108	1.071	1.111

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	38	98	151	0	0	0
normalized size	1	1.	0.84	2.18	3.36	0.	0.	0.
time (sec)	N/A	0.041	0.007	0.052	1.632	0.	0.	0.

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	40	46	72	150	150	49
normalized size	1	1.	0.85	0.98	1.53	3.19	3.19	1.04
time (sec)	N/A	0.032	0.017	0.046	1.007	2.222	1.962	1.109

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	35	68	86	0	0	0
normalized size	1	1.	1.	1.94	2.46	0.	0.	0.
time (sec)	N/A	0.037	0.004	0.036	1.597	0.	0.	0.

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	38	98	165	0	0	0
normalized size	1	1.	0.84	2.18	3.67	0.	0.	0.
time (sec)	N/A	0.046	0.006	0.054	1.646	0.	0.	0.

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.018	8.545	0.55	0.	0.	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	233	233	157	526	460	694	627	1045
normalized size	1	1.	0.67	2.26	1.97	2.98	2.69	4.48
time (sec)	N/A	0.357	0.266	0.052	1.496	2.469	8.921	3.224

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	118	312	292	459	357	641
normalized size	1	1.	0.77	2.03	1.9	2.98	2.32	4.16
time (sec)	N/A	0.186	0.145	0.048	1.497	2.388	4.351	1.494

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	97	97	163	146	153	257	177	340
normalized size	1	1.	1.68	1.51	1.58	2.65	1.82	3.51
time (sec)	N/A	0.114	0.082	0.045	1.472	2.301	2.026	1.234

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	38	38	49	42	46	140	51	77
normalized size	1	1.	1.29	1.11	1.21	3.68	1.34	2.03
time (sec)	N/A	0.02	0.012	0.041	0.986	2.147	0.49	1.095

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	162	162	304	224	0	0	0	0
normalized size	1	1.	1.88	1.38	0.	0.	0.	0.
time (sec)	N/A	0.149	0.095	0.06	0.	0.	0.	0.

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	153	153	118	206	239	513	0	396
normalized size	1	1.	0.77	1.35	1.56	3.35	0.	2.59
time (sec)	N/A	0.111	0.164	0.051	1.497	5.349	0.	1.108

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	A	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	228	228	180	437	554	1531	0	1550
normalized size	1	1.	0.79	1.92	2.43	6.71	0.	6.8
time (sec)	N/A	0.278	0.502	0.059	1.521	20.437	0.	6.614

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	382	382	665	1832	0	0	0	0
normalized size	1	1.	1.74	4.8	0.	0.	0.	0.
time (sec)	N/A	0.582	4.98	0.153	0.	0.	0.	0.

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	220	220	286	766	0	0	0	0
normalized size	1	1.	1.3	3.48	0.	0.	0.	0.
time (sec)	N/A	0.384	0.561	0.135	0.	0.	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	102	102	118	236	0	0	0	0
normalized size	1	1.	1.16	2.31	0.	0.	0.	0.
time (sec)	N/A	0.116	0.161	0.143	0.	0.	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	C	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	261	261	0	2201	0	0	0	0
normalized size	1	1.	0.	8.43	0.	0.	0.	0.
time (sec)	N/A	0.177	6.452	1.504	0.	0.	0.	0.

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	567	567	454	1180	0	0	0	0
normalized size	1	1.	0.8	2.08	0.	0.	0.	0.
time (sec)	N/A	1.386	8.941	0.114	0.	0.	0.	0.

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	565	565	2336	3693	0	0	0	0
normalized size	1	1.	4.13	6.54	0.	0.	0.	0.
time (sec)	N/A	0.963	10.451	0.552	0.	0.	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	337	337	630	1570	0	0	0	0
normalized size	1	1.	1.87	4.66	0.	0.	0.	0.
time (sec)	N/A	0.664	1.221	0.517	0.	0.	0.	0.

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	143	143	228	507	0	0	0	0
normalized size	1	1.	1.59	3.55	0.	0.	0.	0.
time (sec)	N/A	0.217	0.312	0.324	0.	0.	0.	0.

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	C	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	372	372	0	4521	0	0	0	0
normalized size	1	1.	0.	12.15	0.	0.	0.	0.
time (sec)	N/A	0.216	55.631	0.865	0.	0.	0.	0.

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	A	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	1233	1233	0	1579	0	0	0	0
normalized size	1	1.	0.	1.28	0.	0.	0.	0.
time (sec)	N/A	2.254	60.416	0.522	0.	0.	0.	0.

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	162	0	0	0	0	0
normalized size	1	1.	0.92	0.	0.	0.	0.	0.
time (sec)	N/A	0.244	0.327	1.395	0.	0.	0.	0.

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.061	5.214	1.3	0.	0.	0.	0.

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.06	0.473	1.349	0.	0.	0.	0.

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	42	42	37	46	47	130	60	80
normalized size	1	1.	0.88	1.1	1.12	3.1	1.43	1.9
time (sec)	N/A	0.044	0.016	0.039	0.974	2.52	5.628	1.096

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	45	45	40	149	51	140	0	88
normalized size	1	1.	0.89	3.31	1.13	3.11	0.	1.96
time (sec)	N/A	0.044	0.035	0.215	0.963	2.718	0.	1.107

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	42	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.046	0.093	1.185	0.	0.	0.	0.

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	B	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	488	488	0	1717	0	0	0	0
normalized size	1	1.	0.	3.52	0.	0.	0.	0.
time (sec)	N/A	0.523	0.293	2.868	0.	0.	0.	0.

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	B	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	321	321	0	931	0	0	0	0
normalized size	1	1.	0.	2.9	0.	0.	0.	0.
time (sec)	N/A	0.32	0.536	1.422	0.	0.	0.	0.

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	93	364	0	0	0	0
normalized size	1	1.	0.95	3.71	0.	0.	0.	0.
time (sec)	N/A	0.069	0.036	0.773	0.	0.	0.	0.

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	42	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.046	0.093	1.186	0.	0.	0.	0.

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	42	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.042	0.825	1.228	0.	0.	0.	0.

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	18	20	23	42	48	41
normalized size	1	1.	1.12	1.25	1.44	2.62	3.	2.56
time (sec)	N/A	0.008	0.005	0.042	0.976	2.353	0.167	1.123

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	403	403	363	8034	0	5146	0	0
normalized size	1	1.	0.9	19.94	0.	12.77	0.	0.
time (sec)	N/A	0.512	0.81	8.365	0.	3.626	0.	0.

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	305	305	272	7678	0	4035	0	0
normalized size	1	1.	0.89	25.17	0.	13.23	0.	0.
time (sec)	N/A	0.406	0.589	31.149	0.	3.491	0.	0.

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	B	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	198	198	555	1142	585	2894	0	0
normalized size	1	1.	2.8	5.77	2.95	14.62	0.	0.
time (sec)	N/A	0.243	1.664	0.314	1.871	3.429	0.	0.

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	17	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.075	0.32	0.385	0.	0.	0.	0.

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	136	1526	417	902	0	0
normalized size	1	1.	0.88	9.91	2.71	5.86	0.	0.
time (sec)	N/A	0.253	0.203	23.174	1.132	2.68	0.	0.

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	110	1491	294	749	0	0
normalized size	1	1.	0.89	12.12	2.39	6.09	0.	0.
time (sec)	N/A	0.22	0.112	12.351	1.065	2.442	0.	0.

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	B	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	85	85	967	1489	614	541	0	0
normalized size	1	1.	11.38	17.52	7.22	6.36	0.	0.
time (sec)	N/A	0.132	2.709	0.11	1.623	2.554	0.	0.

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.104	0.32	0.415	0.	0.	0.	0.

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	141	1527	421	918	0	0
normalized size	1	1.	0.91	9.85	2.72	5.92	0.	0.
time (sec)	N/A	0.261	0.224	22.292	1.131	2.62	0.	0.

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	111	1492	298	763	0	0
normalized size	1	1.	0.9	12.03	2.4	6.15	0.	0.
time (sec)	N/A	0.239	0.092	10.865	1.101	2.58	0.	0.

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	B	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	86	86	847	1681	608	552	0	0
normalized size	1	1.	9.85	19.55	7.07	6.42	0.	0.
time (sec)	N/A	0.142	3.02	0.112	1.602	2.596	0.	0.

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.164	0.771	0.407	0.	0.	0.	0.

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	18	45	14	23	15	14
normalized size	1	1.	1.12	2.81	0.88	1.44	0.94	0.88
time (sec)	N/A	0.013	0.006	0.049	0.946	1.963	0.18	1.105

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	399	399	359	7900	0	4058	0	0
normalized size	1	1.	0.9	19.8	0.	10.17	0.	0.
time (sec)	N/A	0.508	0.766	8.084	0.	3.996	0.	0.

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	303	303	270	7550	0	3298	0	0
normalized size	1	1.	0.89	24.92	0.	10.88	0.	0.
time (sec)	N/A	0.417	0.584	28.744	0.	3.973	0.	0.

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	B	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	198	198	1649	1160	710	2508	0	0
normalized size	1	1.	8.33	5.86	3.59	12.67	0.	0.
time (sec)	N/A	0.254	12.984	0.316	1.909	3.9	0.	0.

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-1)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	17	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.118	0.366	0.405	0.	0.	0.	0.

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	140	1526	0	482	0	0
normalized size	1	1.	0.91	9.91	0.	3.13	0.	0.
time (sec)	N/A	0.266	0.197	22.095	0.	2.501	0.	0.

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	123	110	1491	0	419	0	0
normalized size	1	1.	0.89	12.12	0.	3.41	0.	0.
time (sec)	N/A	0.224	0.101	11.927	0.	2.527	0.	0.

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F(-2)	A	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	85	85	929	1498	0	327	0	0
normalized size	1	1.	10.93	17.62	0.	3.85	0.	0.
time (sec)	N/A	0.136	5.243	0.116	0.	2.509	0.	0.

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.114	0.365	0.418	0.	0.	0.	0.

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	136	1527	0	481	0	0
normalized size	1	1.	0.88	9.85	0.	3.1	0.	0.
time (sec)	N/A	0.257	0.201	22.102	0.	2.674	0.	0.

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	124	124	110	1492	0	416	0	0
normalized size	1	1.	0.89	12.03	0.	3.35	0.	0.
time (sec)	N/A	0.219	0.123	12.221	0.	2.748	0.	0.

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	B	F(-2)	A	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	86	86	872	1756	0	323	0	0
normalized size	1	1.	10.14	20.42	0.	3.76	0.	0.
time (sec)	N/A	0.132	2.616	0.116	0.	2.366	0.	0.

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.117	0.379	0.434	0.	0.	0.	0.

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	299	299	600	7275	0	4072	0	0
normalized size	1	1.	2.01	24.33	0.	13.62	0.	0.
time (sec)	N/A	0.208	0.333	4.991	0.	3.884	0.	0.

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	375	5425	0	2901	0	0
normalized size	1	1.	1.64	23.69	0.	12.67	0.	0.
time (sec)	N/A	0.154	0.189	10.434	0.	3.561	0.	0.

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	278	2688	0	1894	0	0
normalized size	1	1.	1.75	16.91	0.	11.91	0.	0.
time (sec)	N/A	0.102	0.223	8.715	0.	3.34	0.	0.

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	132	196	0	1098	0	0
normalized size	1	1.	1.81	2.68	0.	15.04	0.	0.
time (sec)	N/A	0.041	0.049	0.17	0.	2.736	0.	0.

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	17	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.04	0.75	0.936	0.	0.	0.	0.

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	355	355	305	6930	0	3641	0	0
normalized size	1	1.	0.86	19.52	0.	10.26	0.	0.
time (sec)	N/A	0.455	5.115	10.428	0.	3.269	0.	0.

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	267	267	229	6580	0	2985	0	0
normalized size	1	1.	0.86	24.64	0.	11.18	0.	0.
time (sec)	N/A	0.376	3.93	21.403	0.	3.011	0.	0.

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	288	350	0	2288	0	0
normalized size	1	1.	1.66	2.01	0.	13.15	0.	0.
time (sec)	N/A	0.222	1.347	0.097	0.	6.682	0.	0.

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	17	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.081	5.104	0.447	0.	0.	0.	0.

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	128	1549	174	869	0	0
normalized size	1	1.	0.9	10.91	1.23	6.12	0.	0.
time (sec)	N/A	0.228	0.177	17.627	5.767	2.245	0.	0.

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	113	102	1513	144	720	0	0
normalized size	1	1.	0.9	13.39	1.27	6.37	0.	0.
time (sec)	N/A	0.197	0.086	8.242	5.787	2.175	0.	0.

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	71	1381	108	520	0	0
normalized size	1	1.	0.9	17.48	1.37	6.58	0.	0.
time (sec)	N/A	0.12	0.793	0.118	5.849	2.24	0.	0.

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	21	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.093	3.183	0.414	0.	0.	0.	0.

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	128	1570	174	853	0	0
normalized size	1	1.	0.88	10.83	1.2	5.88	0.	0.
time (sec)	N/A	0.227	0.184	15.757	5.878	2.261	0.	0.

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	102	1534	143	706	0	0
normalized size	1	1.	0.88	13.22	1.23	6.09	0.	0.
time (sec)	N/A	0.194	0.098	5.872	5.817	2.142	0.	0.

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	71	1351	108	509	0	0
normalized size	1	1.	0.87	16.48	1.32	6.21	0.	0.
time (sec)	N/A	0.119	0.711	0.116	5.773	2.246	0.	0.

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.089	3.216	0.446	0.	0.	0.	0.

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	299	299	600	7275	0	4070	0	0
normalized size	1	1.	2.01	24.33	0.	13.61	0.	0.
time (sec)	N/A	0.208	0.336	7.395	0.	3.03	0.	0.

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	229	375	5425	0	2903	0	0
normalized size	1	1.	1.64	23.69	0.	12.68	0.	0.
time (sec)	N/A	0.154	0.202	9.65	0.	2.585	0.	0.

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	159	159	278	2688	0	1894	0	0
normalized size	1	1.	1.75	16.91	0.	11.91	0.	0.
time (sec)	N/A	0.099	0.245	8.72	0.	2.374	0.	0.

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	132	196	0	1098	0	0
normalized size	1	1.	1.78	2.65	0.	14.84	0.	0.
time (sec)	N/A	0.043	0.041	0.143	0.	2.011	0.	0.

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	17	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.037	0.773	0.937	0.	0.	0.	0.

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	351	351	299	6912	0	3614	0	0
normalized size	1	1.	0.85	19.69	0.	10.3	0.	0.
time (sec)	N/A	0.463	5.398	12.255	0.	2.85	0.	0.

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	265	265	225	6514	0	2963	0	0
normalized size	1	1.	0.85	24.58	0.	11.18	0.	0.
time (sec)	N/A	0.376	4.036	20.174	0.	2.561	0.	0.

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	287	350	0	2272	0	0
normalized size	1	1.	1.65	2.01	0.	13.06	0.	0.
time (sec)	N/A	0.232	1.218	0.095	0.	5.706	0.	0.

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	17	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.079	5.209	0.382	0.	0.	0.	0.

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	128	1548	174	856	0	0
normalized size	1	1.	0.9	10.9	1.23	6.03	0.	0.
time (sec)	N/A	0.231	0.172	14.447	5.841	2.069	0.	0.

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	113	102	1512	144	709	0	0
normalized size	1	1.	0.9	13.38	1.27	6.27	0.	0.
time (sec)	N/A	0.203	0.091	6.462	5.886	2.168	0.	0.

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	71	1381	108	512	0	0
normalized size	1	1.	0.9	17.48	1.37	6.48	0.	0.
time (sec)	N/A	0.124	0.623	0.121	5.901	2.219	0.	0.

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	21	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.083	3.162	0.441	0.	0.	0.	0.

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	145	145	128	1571	174	867	0	0
normalized size	1	1.	0.88	10.83	1.2	5.98	0.	0.
time (sec)	N/A	0.232	0.196	16.543	6.041	2.192	0.	0.

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	116	116	102	1535	143	717	0	0
normalized size	1	1.	0.88	13.23	1.23	6.18	0.	0.
time (sec)	N/A	0.205	0.116	8.506	5.902	2.27	0.	0.

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	71	1351	108	517	0	0
normalized size	1	1.	0.87	16.48	1.32	6.3	0.	0.
time (sec)	N/A	0.124	0.644	0.12	5.903	2.172	0.	0.

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.108	3.089	0.424	0.	0.	0.	0.

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	132	1058	0	711	0	0
normalized size	1	1.	0.71	5.66	0.	3.8	0.	0.
time (sec)	N/A	0.608	0.336	0.371	0.	2.409	0.	0.

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	35	35	59	59	46	147	0	0
normalized size	1	1.	1.69	1.69	1.31	4.2	0.	0.
time (sec)	N/A	0.028	0.033	0.033	1.61	2.158	0.	0.

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	71	71	58	50	0	238	0	0
normalized size	1	1.	0.82	0.7	0.	3.35	0.	0.
time (sec)	N/A	0.047	0.01	0.185	0.	2.193	0.	0.

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	103	76	0	298	0	0
normalized size	1	1.	1.	0.74	0.	2.89	0.	0.
time (sec)	N/A	0.07	0.008	0.154	0.	2.236	0.	0.

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	51	51	83	106	85	297	0	0
normalized size	1	1.	1.63	2.08	1.67	5.82	0.	0.
time (sec)	N/A	0.03	0.079	0.058	1.635	2.382	0.	0.

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	83	355	0	431	0	0
normalized size	1	1.	0.81	3.45	0.	4.18	0.	0.
time (sec)	N/A	0.062	0.014	0.25	0.	2.455	0.	0.

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	151	151	413	0	540	0	0
normalized size	1	1.	1.	2.74	0.	3.58	0.	0.
time (sec)	N/A	0.098	0.008	0.253	0.	2.696	0.	0.

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	196	196	167	186	302	554	0	0
normalized size	1	1.	0.85	0.95	1.54	2.83	0.	0.
time (sec)	N/A	0.154	0.182	0.057	1.712	2.691	0.	0.

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	250	250	250	678	0	778	0	0
normalized size	1	1.	1.	2.71	0.	3.11	0.	0.
time (sec)	N/A	2.654	0.284	0.414	0.	2.818	0.	0.

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	C	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	313	313	313	764	0	967	0	0
normalized size	1	1.	1.	2.44	0.	3.09	0.	0.
time (sec)	N/A	2.448	0.229	0.408	0.	2.806	0.	0.

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	27	27	27	25	26	84	19	28
normalized size	1	1.	1.	0.93	0.96	3.11	0.7	1.04
time (sec)	N/A	0.02	0.021	0.027	0.987	2.4	12.894	1.095

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	19	23	43	12	24
normalized size	1	1.	1.	1.12	1.35	2.53	0.71	1.41
time (sec)	N/A	0.04	0.045	0.128	1.014	2.35	0.74	1.146

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	F(-1)	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	47	47	61	1281	63	343	0	89
normalized size	1	1.	1.3	27.26	1.34	7.3	0.	1.89
time (sec)	N/A	0.074	0.104	0.337	1.525	2.494	0.	1.143

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	A	B	F(-1)	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	103	103	146	1358	177	741	0	208
normalized size	1	1.	1.42	13.18	1.72	7.19	0.	2.02
time (sec)	N/A	0.139	0.139	0.394	1.541	2.715	0.	1.134

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	A	B	F(-1)	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	180	180	89	1323	225	1153	0	344
normalized size	1	1.	0.49	7.35	1.25	6.41	0.	1.91
time (sec)	N/A	0.178	0.109	0.403	1.54	2.788	0.	1.485

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	A	B	F(-1)	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	180	180	89	1323	225	1152	0	344
normalized size	1	1.	0.49	7.35	1.25	6.4	0.	1.91
time (sec)	N/A	0.18	0.109	0.377	1.543	2.642	0.	1.53

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	A	B	F(-1)	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	103	103	145	859	228	591	0	208
normalized size	1	1.	1.41	8.34	2.21	5.74	0.	2.02
time (sec)	N/A	0.151	0.147	0.356	1.577	2.754	0.	1.14

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	48	48	59	903	65	192	0	88
normalized size	1	1.	1.23	18.81	1.35	4.	0.	1.83
time (sec)	N/A	0.077	0.093	0.307	1.521	2.487	0.	1.132

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [50] had the largest ratio of [1.267]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	4	3	1.	8	0.375
2	A	4	3	1.	8	0.375
3	A	4	3	1.	8	0.375
4	A	4	3	1.	8	0.375
5	A	3	3	1.	6	0.5
6	A	2	2	1.	4	0.5
7	A	3	2	1.	8	0.25
8	A	5	5	1.	8	0.625

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
9	A	3	3	1.	8	0.375
10	A	4	3	1.	8	0.375
11	A	4	3	1.	8	0.375
12	A	15	7	1.	10	0.7
13	A	14	9	1.	10	0.9
14	A	10	7	1.	10	0.7
15	A	9	8	1.	10	0.8
16	A	5	5	1.	8	0.625
17	A	5	5	1.	6	0.833
18	A	6	5	1.	10	0.5
19	A	4	4	1.	10	0.4
20	A	8	7	1.	10	0.7
21	A	8	7	1.	10	0.7
22	A	13	8	1.	10	0.8
23	A	33	11	1.	10	1.1
24	A	22	11	1.	10	1.1
25	A	18	10	1.	10	1.
26	A	11	9	1.	10	0.9
27	A	8	8	1.	8	1.
28	A	5	6	1.	6	1.
29	A	8	6	1.	10	0.6
30	A	5	6	1.	10	0.6
31	A	7	6	1.	10	0.6
32	A	14	11	1.	10	1.1
33	A	16	8	1.	10	0.8
34	A	0	0	0.	0	0.
35	A	0	0	0.	0	0.
36	A	2	2	1.	8	0.25
37	A	9	7	1.	13	0.538
38	A	8	8	1.	13	0.615
39	A	4	4	1.	13	0.308
40	A	4	4	1.	11	0.364

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
41	A	1	1	1.	10	0.1
42	A	3	3	1.	13	0.231
43	A	7	7	1.	13	0.538
44	A	7	7	1.	13	0.538
45	A	12	8	1.	13	0.615
46	A	28	15	1.	15	1.
47	A	10	5	1.	13	0.385
48	A	25	13	1.	12	1.083
49	A	15	7	1.	15	0.467
50	A	31	19	1.	15	1.267
51	A	1	1	1.	12	0.083
52	A	1	1	1.	12	0.083
53	A	4	4	1.	14	0.286
54	A	4	4	1.	14	0.286
55	A	5	5	1.	14	0.357
56	A	5	4	1.	12	0.333
57	A	27	13	1.	14	0.929
58	A	24	12	1.	14	0.857
59	A	0	0	0.	0	0.
60	A	0	0	0.	0	0.
61	A	5	6	1.	16	0.375
62	A	7	9	1.	16	0.562
63	A	8	9	1.	16	0.562
64	A	8	9	1.	16	0.562
65	A	3	3	1.	14	0.214
66	A	2	2	1.	14	0.143
67	A	1	1	1.	14	0.071
68	A	2	2	1.	14	0.143
69	A	3	2	1.	14	0.143
70	A	3	3	1.	11	0.273
71	A	4	3	1.	11	0.273
72	A	2	2	1.	10	0.2

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
73	A	4	4	1.	12	0.333
74	A	4	3	1.	10	0.3
75	A	4	4	1.	10	0.4
76	A	2	2	1.	8	0.25
77	A	4	3	1.	10	0.3
78	A	5	5	1.	10	0.5
79	A	4	4	1.	10	0.4
80	A	11	8	1.	10	0.8
81	A	11	8	1.	10	0.8
82	A	10	7	1.	6	1.167
83	A	10	7	1.	10	0.7
84	A	11	8	1.	10	0.8
85	A	6	4	1.	10	0.4
86	A	5	4	1.	8	0.5
87	A	4	4	1.	6	0.667
88	A	4	3	1.	10	0.3
89	A	4	4	1.	10	0.4
90	A	5	4	1.	10	0.4
91	A	3	2	1.	12	0.167
92	A	3	2	1.	12	0.167
93	A	2	2	1.	12	0.167
94	A	4	4	1.	12	0.333
95	A	3	2	1.	12	0.167
96	A	3	3	1.	4	0.75
97	A	4	3	1.	10	0.3
98	A	4	3	1.	10	0.3
99	A	7	6	1.	10	0.6
100	A	7	6	1.	10	0.6
101	A	7	6	1.	8	0.75
102	A	3	3	1.	6	0.5
103	A	5	5	1.	10	0.5
104	A	7	7	1.	10	0.7

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
105	A	8	7	1.	10	0.7
106	A	8	7	1.	10	0.7
107	A	37	7	1.02	16	0.438
108	A	5	5	1.	14	0.357
109	A	37	10	1.25	16	0.625
110	A	57	11	1.11	16	0.688
111	A	55	16	1.	18	0.889
112	A	65	19	1.	18	1.056
113	A	12	8	1.	19	0.421
114	A	2	2	1.	28	0.071
115	A	3	3	1.	33	0.091
116	A	0	0	0.	0	0.
117	A	0	0	0.	0	0.
118	A	4	4	1.	35	0.114
119	A	5	5	1.	40	0.125
120	A	0	0	0.	0	0.
121	A	0	0	0.	0	0.
122	A	5	4	1.	14	0.286
123	A	4	4	1.	12	0.333
124	A	4	3	1.	14	0.214
125	A	6	6	1.	14	0.429
126	A	5	4	1.	12	0.333
127	A	5	4	1.	19	0.21
128	A	0	0	0.	0	0.
129	A	7	6	1.	18	0.333
130	A	7	6	1.	18	0.333
131	A	7	6	1.	16	0.375
132	A	4	3	1.	10	0.3
133	A	5	5	1.	18	0.278
134	A	8	8	1.	18	0.444
135	A	9	8	1.	18	0.444
136	A	16	13	1.	20	0.65

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
137	A	13	10	1.	18	0.556
138	A	6	6	1.	12	0.5
139	A	2	2	1.	20	0.1
140	A	25	25	1.	20	1.25
141	A	21	14	1.	20	0.7
142	A	15	11	1.	18	0.611
143	A	6	7	1.	12	0.583
144	A	2	2	1.	20	0.1
145	A	35	22	1.	20	1.1
146	A	6	4	1.	18	0.222
147	A	0	0	0.	0	0.
148	A	0	0	0.	0	0.
149	A	4	4	1.	12	0.333
150	A	4	4	1.	14	0.286
151	A	0	0	0.	0	0.
152	A	9	7	1.	40	0.175
153	A	7	6	1.	40	0.15
154	A	4	4	1.	38	0.105
155	A	0	0	0.	0	0.
156	A	0	0	0.	0	0.
157	A	2	2	1.	7	0.286
158	A	11	6	1.	15	0.4
159	A	9	5	1.	13	0.385
160	A	7	4	1.	11	0.364
161	A	0	0	0.	0	0.
162	A	7	7	1.	21	0.333
163	A	6	6	1.	19	0.316
164	A	5	5	1.	17	0.294
165	A	0	0	0.	0	0.
166	A	7	7	1.	22	0.318
167	A	6	6	1.	20	0.3
168	A	5	5	1.	18	0.278

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
169	A	0	0	0.	0	0.
170	A	2	2	1.	7	0.286
171	A	11	6	1.	15	0.4
172	A	9	5	1.	13	0.385
173	A	7	4	1.	11	0.364
174	A	0	0	0.	0	0.
175	A	7	7	1.	21	0.333
176	A	6	6	1.	19	0.316
177	A	5	5	1.	17	0.294
178	A	0	0	0.	0	0.
179	A	7	7	1.	22	0.318
180	A	6	6	1.	20	0.3
181	A	5	5	1.	18	0.278
182	A	0	0	0.	0	0.
183	A	12	6	1.	15	0.4
184	A	10	6	1.	15	0.4
185	A	8	5	1.	13	0.385
186	A	6	4	1.	7	0.571
187	A	0	0	0.	0	0.
188	A	11	6	1.	15	0.4
189	A	9	5	1.	13	0.385
190	A	7	4	1.	11	0.364
191	A	0	0	0.	0	0.
192	A	7	7	1.	19	0.368
193	A	6	6	1.	17	0.353
194	A	5	5	1.	15	0.333
195	A	0	0	0.	0	0.
196	A	7	7	1.	22	0.318
197	A	6	6	1.	20	0.3
198	A	5	5	1.	18	0.278
199	A	0	0	0.	0	0.
200	A	12	6	1.	15	0.4

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	A	10	6	1.	15	0.4
202	A	8	5	1.	13	0.385
203	A	6	4	1.	7	0.571
204	A	0	0	0.	0	0.
205	A	11	6	1.	15	0.4
206	A	9	5	1.	13	0.385
207	A	7	4	1.	11	0.364
208	A	0	0	0.	0	0.
209	A	7	7	1.	19	0.368
210	A	6	6	1.	17	0.353
211	A	5	5	1.	15	0.333
212	A	0	0	0.	0	0.
213	A	7	7	1.	22	0.318
214	A	6	6	1.	20	0.3
215	A	5	5	1.	18	0.278
216	A	0	0	0.	0	0.
217	A	13	9	1.	24	0.375
218	A	4	3	1.	4	0.75
219	A	7	4	1.	6	0.667
220	A	9	5	1.	8	0.625
221	A	4	3	1.	8	0.375
222	A	7	4	1.	10	0.4
223	A	9	5	1.	12	0.417
224	A	6	6	1.	12	0.5
225	A	25	8	1.	14	0.571
226	A	29	9	1.	16	0.562
227	A	5	6	1.	10	0.6
228	A	1	1	1.	19	0.053
229	A	5	5	1.	20	0.25
230	A	8	7	1.	20	0.35
231	A	13	10	1.	20	0.5
232	A	13	10	1.	20	0.5

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
233	A	8	7	1.	20	0.35
234	A	5	5	1.	20	0.25

Chapter 3

Listing of integrals

3.1 $\int x^5 \cot^{-1}(ax)\, dx$

Optimal. Leaf size=51

$$-\frac{x^3}{18a^3}+\frac{x}{6a^5}-\frac{\tan^{-1}(ax)}{6a^6}+\frac{x^5}{30a}+\frac{1}{6}x^6\cot^{-1}(ax)$$

```
[Out] x/(6*a^5) - x^3/(18*a^3) + x^5/(30*a) + (x^6*ArcCot[a*x])/6 - ArcTan[a*x]/(
6*a^6)
```

Rubi [A] time = 0.0251326, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 302, 203}

$$-\frac{x^3}{18a^3}+\frac{x}{6a^5}-\frac{\tan^{-1}(ax)}{6a^6}+\frac{x^5}{30a}+\frac{1}{6}x^6\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^5*ArcCot[a*x],x]
```

```
[Out] x/(6*a^5) - x^3/(18*a^3) + x^5/(30*a) + (x^6*ArcCot[a*x])/6 - ArcTan[a*x]/(
6*a^6)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
```

```
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$
\begin{aligned}
\int x^5 \cot^{-1}(ax)\,dx &= \frac{1}{6}x^6\cot^{-1}(ax) + \frac{1}{6}a\int \frac{x^6}{1+a^2x^2}\,dx \\
&= \frac{1}{6}x^6\cot^{-1}(ax) + \frac{1}{6}a\int \left(\frac{1}{a^6} - \frac{x^2}{a^4} + \frac{x^4}{a^2} - \frac{1}{a^6\left(1+a^2x^2\right)}\right) dx \\
&= \frac{x}{6a^5} - \frac{x^3}{18a^3} + \frac{x^5}{30a} + \frac{1}{6}x^6\cot^{-1}(ax) - \frac{\int \frac{1}{1+a^2x^2}\,dx}{6a^5} \\
&= \frac{x}{6a^5} - \frac{x^3}{18a^3} + \frac{x^5}{30a} + \frac{1}{6}x^6\cot^{-1}(ax) - \frac{\tan^{-1}(ax)}{6a^6}
\end{aligned}
$$

Mathematica [A] time = 0.002514, size = 51, normalized size = 1.

$$
-\frac{x^3}{18a^3} + \frac{x}{6a^5} - \frac{\tan^{-1}(ax)}{6a^6} + \frac{x^5}{30a} + \frac{1}{6}x^6\cot^{-1}(ax)
$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*ArcCot[a*x],x]
```

```
[Out] x/(6*a^5) - x^3/(18*a^3) + x^5/(30*a) + (x^6*ArcCot[a*x])/6 - ArcTan[a*x]/(
6*a^6)
```

Maple [A] time = 0.039, size = 42, normalized size = 0.8

$$\frac{x}{6\,a^5}-\frac{x^3}{18\,a^3}+\frac{x^5}{30\,a}+\frac{x^6\mathrm{arccot}\,(ax)}{6}-\frac{\arctan\,(ax)}{6\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arccot(a*x),x)
```

```
[Out] 1/6*x/a^5-1/18*x^3/a^3+1/30*x^5/a+1/6*x^6*arccot(a*x)-1/6*arctan(a*x)/a^6
```

Maxima [A] time = 1.46764, size = 63, normalized size = 1.24

$$\frac{1}{6}\,x^6\,\mathrm{arccot}\,(ax)+\frac{1}{90}\,a\left(\frac{3\,a^4x^5-5\,a^2x^3+15\,x}{a^6}-\frac{15\,\arctan\,(ax)}{a^7}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/6*x^6*arccot(a*x) + 1/90*a*((3*a^4*x^5 - 5*a^2*x^3 + 15*x)/a^6 - 15*arcta
n(a*x)/a^7)
```

Fricas [A] time = 1.84552, size = 100, normalized size = 1.96

$$\frac{3\,a^5x^5-5\,a^3x^3+15\,ax+15\left(a^6x^6+1\right)\mathrm{arccot}\,(ax)}{90\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/90*(3*a^5*x^5 - 5*a^3*x^3 + 15*a*x + 15*(a^6*x^6 + 1)*arccot(a*x))/a^6
```

Sympy [A] time = 1.59348, size = 48, normalized size = 0.94

$$\begin{cases}\frac{x^6\,\mathrm{acot}\,(ax)}{6}+\frac{x^5}{30a}-\frac{x^3}{18a^3}+\frac{x}{6a^5}+\frac{\mathrm{acot}\,(ax)}{6a^6} & \text{for } a\neq 0\\ \frac{\pi x^6}{12} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*acot(a*x),x)
```

```
[Out] Piecewise((x**6*acot(a*x)/6 + x**5/(30*a) - x**3/(18*a**3) + x/(6*a**5) + a
cot(a*x)/(6*a**6), Ne(a, 0)), (pi*x**6/12, True))
```

Giac [A] time = 1.14345, size = 74, normalized size = 1.45

$$\frac{1}{6}\,x^6\arctan\left(\frac{1}{ax}\right)-\frac{1}{90}\,a\left(\frac{15\,\arctan\left(ax\right)}{a^7}-\frac{3\,a^8x^5-5\,a^6x^3+15\,a^4x}{a^{10}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/6*x^6*arctan(1/(a*x)) - 1/90*a*(15*arctan(a*x)/a^7 - (3*a^8*x^5 - 5*a^6*x
^3 + 15*a^4*x)/a^10)
```

3.2 $\int x^4 \cot^{-1}(ax)\, dx$

Optimal. Leaf size=49

$$-\frac{x^2}{10a^3}+\frac{\log\left(a^2x^2+1\right)}{10a^5}+\frac{x^4}{20a}+\frac{1}{5}x^5\cot^{-1}(ax)$$

```
[Out] -x^2/(10*a^3) + x^4/(20*a) + (x^5*ArcCot[a*x])/5 + Log[1 + a^2*x^2]/(10*a^5
)
```

Rubi [A] time = 0.0363023, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 266, 43}

$$-\frac{x^2}{10a^3}+\frac{\log\left(a^2x^2+1\right)}{10a^5}+\frac{x^4}{20a}+\frac{1}{5}x^5\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^4*ArcCot[a*x],x]
```

```
[Out] -x^2/(10*a^3) + x^4/(20*a) + (x^5*ArcCot[a*x])/5 + Log[1 + a^2*x^2]/(10*a^5
)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int x^4 \cot^{-1}(ax)\,dx &= \frac{1}{5}x^5\cot^{-1}(ax)+\frac{1}{5}a\int\frac{x^5}{1+a^2x^2}\,dx\\ &= \frac{1}{5}x^5\cot^{-1}(ax)+\frac{1}{10}a\,\text{Subst}\left(\int\frac{x^2}{1+a^2x}\,dx,x,x^2\right)\\ &= \frac{1}{5}x^5\cot^{-1}(ax)+\frac{1}{10}a\,\text{Subst}\left(\int\left(-\frac{1}{a^4}+\frac{x}{a^2}+\frac{1}{a^4\left(1+a^2x\right)}\right)dx,x,x^2\right)\\ &= -\frac{x^2}{10a^3}+\frac{x^4}{20a}+\frac{1}{5}x^5\cot^{-1}(ax)+\frac{\log\left(1+a^2x^2\right)}{10a^5}\end{aligned}$$

Mathematica [A] time = 0.0123587, size = 49, normalized size = 1.

$$-\frac{x^2}{10a^3}+\frac{\log\left(a^2x^2+1\right)}{10a^5}+\frac{x^4}{20a}+\frac{1}{5}x^5\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*ArcCot[a*x],x]
```

```
[Out] -x^2/(10*a^3) + x^4/(20*a) + (x^5*ArcCot[a*x])/5 + Log[1 + a^2*x^2]/(10*a^5
)
```

Maple [A] time = 0.04, size = 42, normalized size = 0.9

$$-\frac{x^2}{10\,a^3}+\frac{x^4}{20\,a}+\frac{x^5\text{arccot}\,(ax)}{5}+\frac{\ln\left(a^2x^2+1\right)}{10\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arccot(a*x),x)
```

```
[Out] -1/10*x^2/a^3+1/20*x^4/a+1/5*x^5*arccot(a*x)+1/10*ln(a^2*x^2+1)/a^5
```

Maxima [A] time = 0.97502, size = 62, normalized size = 1.27

$$\frac{1}{5}\,x^{5}\operatorname{arccot}\left(ax\right)+\frac{1}{20}\,a\left(\frac{a^{2}x^{4}-2\,x^{2}}{a^{4}}+\frac{2\,\log\left(a^{2}x^{2}+1\right)}{a^{6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/5*x^5*arccot(a*x) + 1/20*a*((a^2*x^4 - 2*x^2)/a^4 + 2*log(a^2*x^2 + 1)/a^
6)
```

Fricas [A] time = 1.85585, size = 104, normalized size = 2.12

$$\frac{4\,a^{5}x^{5}\operatorname{arccot}\left(ax\right)+a^{4}x^{4}-2\,a^{2}x^{2}+2\,\log\left(a^{2}x^{2}+1\right)}{20\,a^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/20*(4*a^5*x^5*arccot(a*x) + a^4*x^4 - 2*a^2*x^2 + 2*log(a^2*x^2 + 1))/a^5
```

Sympy [A] time = 1.19608, size = 46, normalized size = 0.94

$$\begin{cases}\frac{x^{5}\operatorname{acot}\left(ax\right)}{5}+\frac{x^{4}}{20a}-\frac{x^{2}}{10a^{3}}+\frac{\log\left(a^{2}x^{2}+1\right)}{10a^{5}} & \text{for}\: a\neq 0\\ \frac{\pi x^{5}}{10} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*acot(a*x),x)
```

```
[Out] Piecewise((x**5*acot(a*x)/5 + x**4/(20*a) - x**2/(10*a**3) + log(a**2*x**2
+ 1)/(10*a**5), Ne(a, 0)), (pi*x**5/10, True))
```

<u>Giac</u> [A] time = 1.08115, size = 68, normalized size = 1.39

$$\frac{1}{5}\,x^{5}\arctan\left(\frac{1}{ax}\right)+\frac{1}{20}\,a\left(\frac{a^{2}x^{4}-2\,x^{2}}{a^{4}}+\frac{2\,\log\left(a^{2}x^{2}+1\right)}{a^{6}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/5*x^5*arctan(1/(a*x)) + 1/20*a*((a^2*x^4 - 2*x^2)/a^4 + 2*log(a^2*x^2 + 1
)/a^6)
```

3.3 $\int x^3 \cot^{-1}(ax)\,dx$

Optimal. Leaf size=41

$$-\frac{x}{4a^3}+\frac{\tan^{-1}(ax)}{4a^4}+\frac{x^3}{12a}+\frac{1}{4}x^4\cot^{-1}(ax)$$

```
[Out] -x/(4*a^3) + x^3/(12*a) + (x^4*ArcCot[a*x])/4 + ArcTan[a*x]/(4*a^4)
```

Rubi [A] time = 0.0208234, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 302, 203}

$$-\frac{x}{4a^3}+\frac{\tan^{-1}(ax)}{4a^4}+\frac{x^3}{12a}+\frac{1}{4}x^4\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcCot[a*x],x]
```

```
[Out] -x/(4*a^3) + x^3/(12*a) + (x^4*ArcCot[a*x])/4 + ArcTan[a*x]/(4*a^4)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int x^3 \cot^{-1}(ax)\,dx &= \frac{1}{4}x^4\cot^{-1}(ax) + \frac{1}{4}a\int \frac{x^4}{1+a^2x^2}\,dx\\
&= \frac{1}{4}x^4\cot^{-1}(ax) + \frac{1}{4}a\int \left(-\frac{1}{a^4} + \frac{x^2}{a^2} + \frac{1}{a^4\left(1+a^2x^2\right)}\right)dx\\
&= -\frac{x}{4a^3} + \frac{x^3}{12a} + \frac{1}{4}x^4\cot^{-1}(ax) + \frac{\int \frac{1}{1+a^2x^2}\,dx}{4a^3}\\
&= -\frac{x}{4a^3} + \frac{x^3}{12a} + \frac{1}{4}x^4\cot^{-1}(ax) + \frac{\tan^{-1}(ax)}{4a^4}
\end{aligned}$$

Mathematica [A] time = 0.0022742, size = 41, normalized size = 1.

$$-\frac{x}{4a^3} + \frac{\tan^{-1}(ax)}{4a^4} + \frac{x^3}{12a} + \frac{1}{4}x^4\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*ArcCot[a*x],x]
```

```
[Out] -x/(4*a^3) + x^3/(12*a) + (x^4*ArcCot[a*x])/4 + ArcTan[a*x]/(4*a^4)
```

Maple [A] time = 0.042, size = 34, normalized size = 0.8

$$-\frac{x}{4\,a^3} + \frac{x^3}{12\,a} + \frac{x^4\operatorname{arccot}(ax)}{4} + \frac{\arctan(ax)}{4\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(a*x),x)
```

```
[Out] -1/4*x/a^3+1/12*x^3/a+1/4*x^4*arccot(a*x)+1/4*arctan(a*x)/a^4
```

Maxima [A] time = 1.45369, size = 51, normalized size = 1.24

$$\frac{1}{4}\,x^4\operatorname{arccot}(ax) + \frac{1}{12}\,a\left(\frac{a^2x^3 - 3\,x}{a^4} + \frac{3\,\arctan(ax)}{a^5}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/4*x^4*arccot(a*x) + 1/12*a*((a^2*x^3 - 3*x)/a^4 + 3*arctan(a*x)/a^5)
```

Fricas [A] time = 1.85826, size = 78, normalized size = 1.9

$$\frac{a^3x^3 - 3\,ax + 3\left(a^4x^4 - 1\right)\operatorname{arccot}(ax)}{12\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/12*(a^3*x^3 - 3*a*x + 3*(a^4*x^4 - 1)*arccot(a*x))/a^4
```

Sympy [A] time = 0.883826, size = 39, normalized size = 0.95

$$\begin{cases} \frac{x^4 \operatorname{acot}(ax)}{4} + \frac{x^3}{12a} - \frac{x}{4a^3} - \frac{\operatorname{acot}(ax)}{4a^4} & \text{for } a \neq 0 \\ \frac{\pi x^4}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(a*x),x)
```

```
[Out] Piecewise((x**4*acot(a*x)/4 + x**3/(12*a) - x/(4*a**3) - acot(a*x)/(4*a**4)
, Ne(a, 0)), (pi*x**4/8, True))
```

Giac [A] time = 1.11311, size = 61, normalized size = 1.49

$$\frac{1}{4}\,x^4\arctan\left(\frac{1}{ax}\right) + \frac{1}{12}\,a\left(\frac{3\,\arctan(ax)}{a^5} + \frac{a^4x^3 - 3\,a^2x}{a^6}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/4*x^4*arctan(1/(a*x)) + 1/12*a*(3*arctan(a*x)/a^5 + (a^4*x^3 - 3*a^2*x)/a
^6)
```

3.4 $\int x^2 \cot^{-1}(ax)\,dx$

Optimal. Leaf size=39

$$-\frac{\log\left(a^2x^2+1\right)}{6a^3}+\frac{x^2}{6a}+\frac{1}{3}x^3\cot^{-1}(ax)$$

```
[Out] x^2/(6*a) + (x^3*ArcCot[a*x])/3 - Log[1 + a^2*x^2]/(6*a^3)
```

Rubi [A] time = 0.0260955, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 266, 43}

$$-\frac{\log\left(a^2x^2+1\right)}{6a^3}+\frac{x^2}{6a}+\frac{1}{3}x^3\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[a*x],x]
```

```
[Out] x^2/(6*a) + (x^3*ArcCot[a*x])/3 - Log[1 + a^2*x^2]/(6*a^3)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int x^2 \cot^{-1}(ax)\,dx &= \frac{1}{3}x^3\cot^{-1}(ax) + \frac{1}{3}a\int \frac{x^3}{1+a^2x^2}\,dx \\ &= \frac{1}{3}x^3\cot^{-1}(ax) + \frac{1}{6}a\,\text{Subst}\left(\int \frac{x}{1+a^2x}\,dx, x, x^2\right) \\ &= \frac{1}{3}x^3\cot^{-1}(ax) + \frac{1}{6}a\,\text{Subst}\left(\int \left(\frac{1}{a^2} - \frac{1}{a^2\left(1+a^2x\right)}\right)dx, x, x^2\right) \\ &= \frac{x^2}{6a} + \frac{1}{3}x^3\cot^{-1}(ax) - \frac{\log\left(1+a^2x^2\right)}{6a^3}\end{aligned}$$

Mathematica [A] time = 0.0104125, size = 39, normalized size = 1.

$$-\frac{\log\left(a^2x^2+1\right)}{6a^3} + \frac{x^2}{6a} + \frac{1}{3}x^3\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[a*x],x]
```

```
[Out] x^2/(6*a) + (x^3*ArcCot[a*x])/3 - Log[1 + a^2*x^2]/(6*a^3)
```

Maple [A] time = 0.039, size = 34, normalized size = 0.9

$$\frac{x^2}{6\,a} + \frac{x^3\text{arccot}\,(ax)}{3} - \frac{\ln\left(a^2x^2+1\right)}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(a*x),x)
```

```
[Out] 1/6*x^2/a+1/3*x^3*arccot(a*x)-1/6*ln(a^2*x^2+1)/a^3
```

Maxima [A] time = 0.988707, size = 49, normalized size = 1.26

$$\frac{1}{3}\,x^{3}\operatorname{arccot}\left(ax\right)+\frac{1}{6}\,a\left(\frac{x^{2}}{a^{2}}-\frac{\log\left(a^{2}x^{2}+1\right)}{a^{4}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot(a*x) + 1/6*a*(x^2/a^2 - log(a^2*x^2 + 1)/a^4)
```

Fricas [A] time = 1.92215, size = 84, normalized size = 2.15

$$\frac{2\,a^{3}x^{3}\operatorname{arccot}\left(ax\right)+a^{2}x^{2}-\log\left(a^{2}x^{2}+1\right)}{6\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a^3*x^3*arccot(a*x) + a^2*x^2 - log(a^2*x^2 + 1))/a^3
```

Sympy [A] time = 0.637841, size = 37, normalized size = 0.95

$$\begin{cases}\frac{x^{3}\operatorname{acot}\left(ax\right)}{3}+\frac{x^{2}}{6a}-\frac{\log\left(a^{2}x^{2}+1\right)}{6a^{3}} & \text{for}\ a\neq 0\\ \frac{\pi x^{3}}{6} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(a*x),x)
```

```
[Out] Piecewise((x**3*acot(a*x)/3 + x**2/(6*a) - log(a**2*x**2 + 1)/(6*a**3), Ne(
a, 0)), (pi*x**3/6, True))
```

Giac [A] time = 1.13748, size = 54, normalized size = 1.38

$$\frac{1}{3}x^3\arctan\left(\frac{1}{ax}\right)+\frac{1}{6}a\left(\frac{x^2}{a^2}-\frac{\log\left(a^2x^2+1\right)}{a^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/3*x^3*arctan(1/(a*x)) + 1/6*a*(x^2/a^2 - log(a^2*x^2 + 1)/a^4)
```

3.5 $\int x \cot^{-1}(ax)\,dx$

Optimal. Leaf size=31

$$-\frac{\tan^{-1}(ax)}{2a^2}+\frac{1}{2}x^2\cot^{-1}(ax)+\frac{x}{2a}$$

```
[Out] x/(2*a) + (x^2*ArcCot[a*x])/2 - ArcTan[a*x]/(2*a^2)
```

Rubi [A] time = 0.0115336, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4853, 321, 203}

$$-\frac{\tan^{-1}(ax)}{2a^2}+\frac{1}{2}x^2\cot^{-1}(ax)+\frac{x}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[a*x],x]
```

```
[Out] x/(2*a) + (x^2*ArcCot[a*x])/2 - ArcTan[a*x]/(2*a^2)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int x\cot^{-1}(ax)\,dx &= \frac{1}{2}x^2\cot^{-1}(ax)+\frac{1}{2}a\int\frac{x^2}{1+a^2x^2}\,dx\\ &= \frac{x}{2a}+\frac{1}{2}x^2\cot^{-1}(ax)-\frac{\int\frac{1}{1+a^2x^2}\,dx}{2a}\\ &= \frac{x}{2a}+\frac{1}{2}x^2\cot^{-1}(ax)-\frac{\tan^{-1}(ax)}{2a^2}\end{aligned}$$

Mathematica [A] time = 0.0017257, size = 31, normalized size = 1.

$$-\frac{\tan^{-1}(ax)}{2a^2}+\frac{1}{2}x^2\cot^{-1}(ax)+\frac{x}{2a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[a*x],x]
```

```
[Out] x/(2*a) + (x^2*ArcCot[a*x])/2 - ArcTan[a*x]/(2*a^2)
```

Maple [A] time = 0.039, size = 26, normalized size = 0.8

$$\frac{x}{2a}+\frac{x^2\operatorname{arccot}(ax)}{2}-\frac{\arctan(ax)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(a*x),x)
```

```
[Out] 1/2*x/a+1/2*x^2*arccot(a*x)-1/2*arctan(a*x)/a^2
```

Maxima [A] time = 1.48985, size = 38, normalized size = 1.23

$$\frac{1}{2}x^2\operatorname{arccot}(ax)+\frac{1}{2}a\left(\frac{x}{a^2}-\frac{\arctan(ax)}{a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arccot(a*x) + 1/2*a*(x/a^2 - arctan(a*x)/a^3)
```

Fricas [A] time = 1.90484, size = 58, normalized size = 1.87

$$\frac{ax + \left(a^2x^2 + 1\right)\operatorname{arccot}(ax)}{2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/2*(a*x + (a^2*x^2 + 1)*arccot(a*x))/a^2
```

Sympy [A] time = 0.413212, size = 31, normalized size = 1.

$$\begin{cases} \frac{x^2 \operatorname{acot}(ax)}{2} + \frac{x}{2a} + \frac{\operatorname{acot}(ax)}{2a^2} & \text{for}\ a \neq 0 \\ \frac{\pi x^2}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(a*x),x)
```

```
[Out] Piecewise((x**2*acot(a*x)/2 + x/(2*a) + acot(a*x)/(2*a**2), Ne(a, 0)), (pi*
x**2/4, True))
```

Giac [A] time = 1.11481, size = 43, normalized size = 1.39

$$\frac{1}{2}\,x^2 \arctan\left(\frac{1}{ax}\right) + \frac{1}{2}\,a\left(\frac{x}{a^2} - \frac{\arctan(ax)}{a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/2*x^2*arctan(1/(a*x)) + 1/2*a*(x/a^2 - arctan(a*x)/a^3)
```

3.6 $\int \cot^{-1}(ax)\,dx$

Optimal. Leaf size=24

$$\frac{\log\left(a^2x^2+1\right)}{2a}+x\cot^{-1}(ax)$$

```
[Out] x*ArcCot[a*x] + Log[1 + a^2*x^2]/(2*a)
```

Rubi [A] time = 0.0059009, antiderivative size = 24, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4847, 260}

$$\frac{\log\left(a^2x^2+1\right)}{2a}+x\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x],x]
```

```
[Out] x*ArcCot[a*x] + Log[1 + a^2*x^2]/(2*a)
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int \cot^{-1}(ax)\,dx &= x\cot^{-1}(ax)+a\int \frac{x}{1+a^2x^2}\,dx\\ &= x\cot^{-1}(ax)+\frac{\log\left(1+a^2x^2\right)}{2a}\end{aligned}$$

Mathematica [A] time = 0.0027033, size = 24, normalized size = 1.

$$\frac{\log\left(a^2x^2+1\right)}{2a}+x\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x],x]
```

```
[Out] x*ArcCot[a*x] + Log[1 + a^2*x^2]/(2*a)
```

Maple [A] time = 0.036, size = 23, normalized size = 1.

$$x\mathrm{arccot}\left(ax\right)+\frac{\ln\left(a^2x^2+1\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x),x)
```

```
[Out] x*arccot(a*x)+1/2*ln(a^2*x^2+1)/a
```

Maxima [A] time = 0.972293, size = 32, normalized size = 1.33

$$\frac{2\,ax\,\mathrm{arccot}\left(ax\right)+\log\left(a^2x^2+1\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/2*(2*a*x*arccot(a*x) + log(a^2*x^2 + 1))/a
```

Fricas [A] time = 2.02604, size = 62, normalized size = 2.58

$$\frac{2\,ax\,\mathrm{arccot}\left(ax\right)+\log\left(a^2x^2+1\right)}{2\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/2*(2*a*x*arccot(a*x) + log(a^2*x^2 + 1))/a
```

Sympy [A] time = 0.257776, size = 24, normalized size = 1.

$$\begin{cases} x \operatorname{acot}{\left(a x \right)} + \frac{\log{\left(a^{2} x^{2} + 1 \right)}}{2 a} & \text{for}\: a \neq 0 \\ \frac{\pi x}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x),x)
```

```
[Out] Piecewise((x*acot(a*x) + log(a**2*x**2 + 1)/(2*a), Ne(a, 0)), (pi*x/2, True
))
```

Giac [A] time = 1.12187, size = 35, normalized size = 1.46

$$x \arctan\left(\frac{1}{ax}\right) + \frac{\log\left(a^{2} x^{2} + 1\right)}{2 \, a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x),x, algorithm="giac")
```

```
[Out] x*arctan(1/(a*x)) + 1/2*log(a^2*x^2 + 1)/a
```

3.7 $\int \frac{\cot^{-1}(ax)}{x} dx$

Optimal. Leaf size=37

$$\frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{ax}\right)-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{ax}\right)$$

```
[Out] (-I/2)*PolyLog[2, (-I)/(a*x)] + (I/2)*PolyLog[2, I/(a*x)]
```

Rubi [A] time = 0.0252205, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4849, 2391}

$$\frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{ax}\right)-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{ax}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/x,x]
```

```
[Out] (-I/2)*PolyLog[2, (-I)/(a*x)] + (I/2)*PolyLog[2, I/(a*x)]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}(ax)}{x}\,dx &= \frac{1}{2}i\int \frac{\log\left(1-\frac{i}{ax}\right)}{x}\,dx-\frac{1}{2}i\int \frac{\log\left(1+\frac{i}{ax}\right)}{x}\,dx\\ &= -\frac{1}{2}i\text{Li}_2\left(-\frac{i}{ax}\right)+\frac{1}{2}i\text{Li}_2\left(\frac{i}{ax}\right)\end{aligned}$$

Mathematica [A] time = 0.0026943, size = 37, normalized size = 1.

$$\frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{ax}\right)-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{ax}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/x,x]
```

```
[Out] (-I/2)*PolyLog[2, (-I)/(a*x)] + (I/2)*PolyLog[2, I/(a*x)]
```

Maple [B] time = 0.049, size = 63, normalized size = 1.7

$$\ln(ax)\,\text{arccot}(ax)-\frac{i}{2}\ln(ax)\ln(1+iax)+\frac{i}{2}\ln(ax)\ln(1-iax)-\frac{i}{2}\text{dilog}(1+iax)+\frac{i}{2}\text{dilog}(1-iax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/x,x)
```

```
[Out] ln(a*x)*arccot(a*x)-1/2*I*ln(a*x)*ln(1+I*a*x)+1/2*I*ln(a*x)*ln(1-I*a*x)-1/2
*I*dilog(1+I*a*x)+1/2*I*dilog(1-I*a*x)
```

Maxima [B] time = 1.62585, size = 89, normalized size = 2.41

$$-i\arctan(ax)\arctan(0,a)+\frac{1}{4}\pi\log\left(a^2x^2+1\right)-\arctan(ax)\log(x|a|)+\text{arccot}(ax)\log(x)+\arctan(ax)\log(x)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x,x, algorithm="maxima")
```

```
[Out] -I*arctan(a*x)*arctan2(0, a) + 1/4*pi*log(a^2*x^2 + 1) - arctan(a*x)*log(x*
abs(a)) + arccot(a*x)*log(x) + arctan(a*x)*log(x) + 1/2*I*dilog(I*a*x + 1)
- 1/2*I*dilog(-I*a*x + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(ax)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/x,x)
```

```
[Out] Integral(acot(a*x)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)/x, x)
```

3.8 $\int \frac{\cot^{-1}(ax)}{x^2} \, dx$

Optimal. Leaf size=30

$$\frac{1}{2}a\log\left(a^2x^2+1\right)-a\log(x)-\frac{\cot^{-1}(ax)}{x}$$

```
[Out] -(ArcCot[a*x]/x) - a*Log[x] + (a*Log[1 + a^2*x^2])/2
```

Rubi [A] time = 0.0178592, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4853, 266, 36, 29, 31}

$$\frac{1}{2}a\log\left(a^2x^2+1\right)-a\log(x)-\frac{\cot^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/x^2,x]
```

```
[Out] -(ArcCot[a*x]/x) - a*Log[x] + (a*Log[1 + a^2*x^2])/2
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}(ax)}{x^2}\,dx &= -\frac{\cot^{-1}(ax)}{x} - a\int \frac{1}{x\left(1+a^2x^2\right)}\,dx \\
&= -\frac{\cot^{-1}(ax)}{x} - \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x\left(1+a^2x\right)}\,dx, x, x^2\right) \\
&= -\frac{\cot^{-1}(ax)}{x} - \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x}\,dx, x, x^2\right) + \frac{1}{2}a^3\,\text{Subst}\left(\int \frac{1}{1+a^2x}\,dx, x, x^2\right) \\
&= -\frac{\cot^{-1}(ax)}{x} - a\log(x) + \frac{1}{2}a\log\left(1+a^2x^2\right)
\end{aligned}$$

Mathematica [A] time = 0.0022753, size = 30, normalized size = 1.

$$\frac{1}{2}a\log\left(a^2x^2+1\right) - a\log(x) - \frac{\cot^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/x^2,x]
```

```
[Out] -(ArcCot[a*x]/x) - a*Log[x] + (a*Log[1 + a^2*x^2])/2
```

Maple [A] time = 0.043, size = 31, normalized size = 1.

$$-\frac{\operatorname{arccot}(ax)}{x} + \frac{a\ln\left(a^2x^2+1\right)}{2} - a\ln(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/x^2,x)
```

```
[Out] -arccot(a*x)/x+1/2*a*ln(a^2*x^2+1)-a*ln(a*x)
```

Maxima [A] time = 0.966614, size = 41, normalized size = 1.37

$$\frac{1}{2}a\left(\log\left(a^2x^2+1\right)-\log\left(x^2\right)\right)-\frac{\operatorname{arccot}(ax)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(log(a^2*x^2 + 1) - log(x^2)) - arccot(a*x)/x
```

Fricas [A] time = 1.91349, size = 82, normalized size = 2.73

$$\frac{ax\log\left(a^2x^2+1\right)-2\,ax\log(x)-2\,\operatorname{arccot}(ax)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^2,x, algorithm="fricas")
```

```
[Out] 1/2*(a*x*log(a^2*x^2 + 1) - 2*a*x*log(x) - 2*arccot(a*x))/x
```

Sympy [A] time = 0.34515, size = 24, normalized size = 0.8

$$-a\log(x)+\frac{a\log\left(a^2x^2+1\right)}{2}-\frac{\operatorname{acot}(ax)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/x**2,x)
```

```
[Out] -a*log(x) + a*log(a**2*x**2 + 1)/2 - acot(a*x)/x
```

Giac [A] time = 1.09297, size = 46, normalized size = 1.53

$$\frac{1}{2}\,a\left(\log\left(a^2x^2+1\right)-\log\left(x^2\right)\right)-\frac{\arctan\left(\frac{1}{ax}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^2,x, algorithm="giac")
```

```
[Out] 1/2*a*(log(a^2*x^2 + 1) - log(x^2)) - arctan(1/(a*x))/x
```

3.9 $\int \frac{\cot^{-1}(ax)}{x^3} dx$

Optimal. Leaf size=31

$$\frac{1}{2}a^2\tan^{-1}(ax) - \frac{\cot^{-1}(ax)}{2x^2} + \frac{a}{2x}$$

```
[Out] a/(2*x) - ArcCot[a*x]/(2*x^2) + (a^2*ArcTan[a*x])/2
```

Rubi [A] time = 0.0148004, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 325, 203}

$$\frac{1}{2}a^2\tan^{-1}(ax) - \frac{\cot^{-1}(ax)}{2x^2} + \frac{a}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/x^3,x]
```

```
[Out] a/(2*x) - ArcCot[a*x]/(2*x^2) + (a^2*ArcTan[a*x])/2
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}(ax)}{x^3}\,dx &= -\frac{\cot^{-1}(ax)}{2x^2} - \frac{1}{2}a\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx\\ &= \frac{a}{2x} - \frac{\cot^{-1}(ax)}{2x^2} + \frac{1}{2}a^3\int \frac{1}{1+a^2x^2}\,dx\\ &= \frac{a}{2x} - \frac{\cot^{-1}(ax)}{2x^2} + \frac{1}{2}a^2\tan^{-1}(ax)\end{aligned}$$

Mathematica [C] time = 0.0023036, size = 36, normalized size = 1.16

$$\frac{a\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-a^2x^2\right)}{2x} - \frac{\cot^{-1}(ax)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/x^3,x]
```

```
[Out] -ArcCot[a*x]/(2*x^2) + (a*Hypergeometric2F1[-1/2, 1, 1/2, -(a^2*x^2)])/(2*x
)
```

Maple [A] time = 0.043, size = 26, normalized size = 0.8

$$\frac{a}{2\,x} - \frac{\operatorname{arccot}(ax)}{2\,x^2} + \frac{a^2\arctan(ax)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/x^3,x)
```

```
[Out] 1/2*a/x-1/2*arccot(a*x)/x^2+1/2*a^2*arctan(a*x)
```

Maxima [A] time = 1.50052, size = 31, normalized size = 1.

$$\frac{1}{2}\left(a\arctan\left(ax\right)+\frac{1}{x}\right)a-\frac{\operatorname{arccot}\left(ax\right)}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*(a*arctan(a*x) + 1/x)*a - 1/2*arccot(a*x)/x^2
```

Fricas [A] time = 1.87474, size = 58, normalized size = 1.87

$$\frac{ax-\left(a^{2}x^{2}+1\right)\operatorname{arccot}\left(ax\right)}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^3,x, algorithm="fricas")
```

```
[Out] 1/2*(a*x - (a^2*x^2 + 1)*arccot(a*x))/x^2
```

Sympy [A] time = 0.631373, size = 24, normalized size = 0.77

$$-\frac{a^{2}\operatorname{acot}\left(ax\right)}{2}+\frac{a}{2x}-\frac{\operatorname{acot}\left(ax\right)}{2x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/x**3,x)
```

```
[Out] -a**2*acot(a*x)/2 + a/(2*x) - acot(a*x)/(2*x**2)
```

Giac [A] time = 1.1101, size = 36, normalized size = 1.16

$$\frac{1}{2}\left(a\arctan\left(ax\right)+\frac{1}{x}\right)a-\frac{\arctan\left(\frac{1}{ax}\right)}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^3,x, algorithm="giac")
```

```
[Out] 1/2*(a*arctan(a*x) + 1/x)*a - 1/2*arctan(1/(a*x))/x^2
```

3.10 $\int \frac{\cot^{-1}(ax)}{x^4} \, dx$

Optimal. Leaf size=46

$$-\frac{1}{6}a^3 \log\left(a^2x^2+1\right) + \frac{1}{3}a^3 \log(x) + \frac{a}{6x^2} - \frac{\cot^{-1}(ax)}{3x^3}$$

```
[Out] a/(6*x^2) - ArcCot[a*x]/(3*x^3) + (a^3*Log[x])/3 - (a^3*Log[1 + a^2*x^2])/6
```

Rubi [A] time = 0.0271508, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 266, 44}

$$-\frac{1}{6}a^3 \log\left(a^2x^2+1\right) + \frac{1}{3}a^3 \log(x) + \frac{a}{6x^2} - \frac{\cot^{-1}(ax)}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/x^4,x]
```

```
[Out] a/(6*x^2) - ArcCot[a*x]/(3*x^3) + (a^3*Log[x])/3 - (a^3*Log[1 + a^2*x^2])/6
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}(ax)}{x^4}\,dx &= -\frac{\cot^{-1}(ax)}{3x^3}-\frac{1}{3}a\int \frac{1}{x^3\left(1+a^2x^2\right)}\,dx\\ &= -\frac{\cot^{-1}(ax)}{3x^3}-\frac{1}{6}a\,\text{Subst}\left(\int \frac{1}{x^2\left(1+a^2x\right)}\,dx,x,x^2\right)\\ &= -\frac{\cot^{-1}(ax)}{3x^3}-\frac{1}{6}a\,\text{Subst}\left(\int \left(\frac{1}{x^2}-\frac{a^2}{x}+\frac{a^4}{1+a^2x}\right)dx,x,x^2\right)\\ &= \frac{a}{6x^2}-\frac{\cot^{-1}(ax)}{3x^3}+\frac{1}{3}a^3\log(x)-\frac{1}{6}a^3\log\left(1+a^2x^2\right)\end{aligned}$$

Mathematica [A] time = 0.0113659, size = 44, normalized size = 0.96

$$-\frac{1}{6}a\left(a^2\log\left(a^2x^2+1\right)-2a^2\log(x)-\frac{1}{x^2}\right)-\frac{\cot^{-1}(ax)}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/x^4,x]
```

```
[Out] -ArcCot[a*x]/(3*x^3) - (a*(-x^(-2) - 2*a^2*Log[x] + a^2*Log[1 + a^2*x^2]))/
6
```

Maple [A] time = 0.044, size = 41, normalized size = 0.9

$$-\frac{\text{arccot}\,(ax)}{3\,x^3}-\frac{a^3\ln\left(a^2x^2+1\right)}{6}+\frac{a}{6\,x^2}+\frac{a^3\ln\,(ax)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/x^4,x)
```

```
[Out] -1/3*arccot(a*x)/x^3-1/6*a^3*ln(a^2*x^2+1)+1/6*a/x^2+1/3*a^3*ln(a*x)
```

Maxima [A] time = 0.980529, size = 57, normalized size = 1.24

$$-\frac{1}{6}\left(a^2\log\left(a^2x^2+1\right)-a^2\log\left(x^2\right)-\frac{1}{x^2}\right)a-\frac{\operatorname{arccot}(ax)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*(a^2*log(a^2*x^2 + 1) - a^2*log(x^2) - 1/x^2)*a - 1/3*arccot(a*x)/x^3
```

Fricas [A] time = 1.99549, size = 105, normalized size = 2.28

$$-\frac{a^3x^3\log\left(a^2x^2+1\right)-2\,a^3x^3\log(x)-ax+2\,\operatorname{arccot}(ax)}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^4,x, algorithm="fricas")
```

```
[Out] -1/6*(a^3*x^3*log(a^2*x^2 + 1) - 2*a^3*x^3*log(x) - a*x + 2*arccot(a*x))/x^
3
```

Sympy [A] time = 0.869719, size = 39, normalized size = 0.85

$$\frac{a^3\log(x)}{3}-\frac{a^3\log\left(a^2x^2+1\right)}{6}+\frac{a}{6x^2}-\frac{\operatorname{acot}(ax)}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/x**4,x)
```

```
[Out] a**3*log(x)/3 - a**3*log(a**2*x**2 + 1)/6 + a/(6*x**2) - acot(a*x)/(3*x**3)
```

Giac [A] time = 1.12538, size = 73, normalized size = 1.59

$$-\frac{1}{6}\left(a^2\log\left(a^2x^2+1\right)-a^2\log\left(x^2\right)+\frac{a^2x^2-1}{x^2}\right)a-\frac{\arctan\left(\frac{1}{ax}\right)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^4,x, algorithm="giac")
```

```
[Out] -1/6*(a^2*log(a^2*x^2 + 1) - a^2*log(x^2) + (a^2*x^2 - 1)/x^2)*a - 1/3*arct
an(1/(a*x))/x^3
```

3.11 $\int \frac{\cot^{-1}(ax)}{x^5} \, dx$

Optimal. Leaf size=41

$$-\frac{a^3}{4x} - \frac{1}{4}a^4\tan^{-1}(ax) + \frac{a}{12x^3} - \frac{\cot^{-1}(ax)}{4x^4}$$

```
[Out] a/(12*x^3) - a^3/(4*x) - ArcCot[a*x]/(4*x^4) - (a^4*ArcTan[a*x])/4
```

Rubi [A] time = 0.018415, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4853, 325, 203}

$$-\frac{a^3}{4x} - \frac{1}{4}a^4\tan^{-1}(ax) + \frac{a}{12x^3} - \frac{\cot^{-1}(ax)}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/x^5,x]
```

```
[Out] a/(12*x^3) - a^3/(4*x) - ArcCot[a*x]/(4*x^4) - (a^4*ArcTan[a*x])/4
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}(ax)}{x^5}\,dx &= -\frac{\cot^{-1}(ax)}{4x^4} - \frac{1}{4}a\int \frac{1}{x^4\left(1+a^2x^2\right)}\,dx\\ &= \frac{a}{12x^3} - \frac{\cot^{-1}(ax)}{4x^4} + \frac{1}{4}a^3\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx\\ &= \frac{a}{12x^3} - \frac{a^3}{4x} - \frac{\cot^{-1}(ax)}{4x^4} - \frac{1}{4}a^5\int \frac{1}{1+a^2x^2}\,dx\\ &= \frac{a}{12x^3} - \frac{a^3}{4x} - \frac{\cot^{-1}(ax)}{4x^4} - \frac{1}{4}a^4\tan^{-1}(ax)\end{aligned}$$

Mathematica [C] time = 0.0027656, size = 36, normalized size = 0.88

$$\frac{a\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-a^2x^2\right)}{12x^3} - \frac{\cot^{-1}(ax)}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/x^5,x]
```

```
[Out] -ArcCot[a*x]/(4*x^4) + (a*Hypergeometric2F1[-3/2, 1, -1/2, -(a^2*x^2)])/(12
*x^3)
```

Maple [A] time = 0.046, size = 34, normalized size = 0.8

$$\frac{a}{12\,x^3} - \frac{a^3}{4\,x} - \frac{\operatorname{arccot}(ax)}{4\,x^4} - \frac{a^4\arctan(ax)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/x^5,x)
```

```
[Out] 1/12*a/x^3-1/4*a^3/x-1/4*arccot(a*x)/x^4-1/4*a^4*arctan(a*x)
```

Maxima [A] time = 1.48393, size = 50, normalized size = 1.22

$$-\frac{1}{12}\left(3\,a^3\arctan\left(ax\right)+\frac{3\,a^2x^2-1}{x^3}\right)a-\frac{\operatorname{arccot}\left(ax\right)}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^5,x, algorithm="maxima")
```

```
[Out] -1/12*(3*a^3*arctan(a*x) + (3*a^2*x^2 - 1)/x^3)*a - 1/4*arccot(a*x)/x^4
```

Fricas [A] time = 1.86439, size = 80, normalized size = 1.95

$$-\frac{3\,a^3x^3-ax-3\left(a^4x^4-1\right)\operatorname{arccot}\left(ax\right)}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^5,x, algorithm="fricas")
```

```
[Out] -1/12*(3*a^3*x^3 - a*x - 3*(a^4*x^4 - 1)*arccot(a*x))/x^4
```

Sympy [A] time = 1.01842, size = 32, normalized size = 0.78

$$\frac{a^4\operatorname{acot}\left(ax\right)}{4}-\frac{a^3}{4x}+\frac{a}{12x^3}-\frac{\operatorname{acot}\left(ax\right)}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/x**5,x)
```

```
[Out] a**4*acot(a*x)/4 - a**3/(4*x) + a/(12*x**3) - acot(a*x)/(4*x**4)
```

Giac [A] time = 1.12323, size = 55, normalized size = 1.34

$$-\frac{1}{12}\left(3\,a^3\arctan\left(ax\right)+\frac{3\,a^2x^2-1}{x^3}\right)a-\frac{\arctan\left(\frac{1}{ax}\right)}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/x^5,x, algorithm="giac")
```

```
[Out] -1/12*(3*a^3*arctan(a*x) + (3*a^2*x^2 - 1)/x^3)*a - 1/4*arctan(1/(a*x))/x^4
```

3.12 $\int x^5 \cot^{-1}(ax)^2\,dx$

Optimal. Leaf size=104

$$\frac{x^4}{60a^2}-\frac{4x^2}{45a^4}+\frac{23\log\left(a^2x^2+1\right)}{90a^6}-\frac{x^3\cot^{-1}(ax)}{9a^3}+\frac{x\cot^{-1}(ax)}{3a^5}+\frac{\cot^{-1}(ax)^2}{6a^6}+\frac{1}{6}x^6\cot^{-1}(ax)^2+\frac{x^5\cot^{-1}(ax)}{15a}$$

```
[Out] (-4*x^2)/(45*a^4) + x^4/(60*a^2) + (x*ArcCot[a*x])/(3*a^5) - (x^3*ArcCot[a*
x])/(9*a^3) + (x^5*ArcCot[a*x])/(15*a) + ArcCot[a*x]^2/(6*a^6) + (x^6*ArcCo
t[a*x]^2)/6 + (23*Log[1 + a^2*x^2])/(90*a^6)
```

Rubi [A] time = 0.221475, antiderivative size = 104, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {4853, 4917, 266, 43, 4847, 260, 4885}

$$\frac{x^4}{60a^2}-\frac{4x^2}{45a^4}+\frac{23\log\left(a^2x^2+1\right)}{90a^6}-\frac{x^3\cot^{-1}(ax)}{9a^3}+\frac{x\cot^{-1}(ax)}{3a^5}+\frac{\cot^{-1}(ax)^2}{6a^6}+\frac{1}{6}x^6\cot^{-1}(ax)^2+\frac{x^5\cot^{-1}(ax)}{15a}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*ArcCot[a*x]^2,x]
```

```
[Out] (-4*x^2)/(45*a^4) + x^4/(60*a^2) + (x*ArcCot[a*x])/(3*a^5) - (x^3*ArcCot[a*
x])/(9*a^3) + (x^5*ArcCot[a*x])/(15*a) + ArcCot[a*x]^2/(6*a^6) + (x^6*ArcCo
t[a*x]^2)/6 + (23*Log[1 + a^2*x^2])/(90*a^6)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int x^5 \cot^{-1}(ax)^2 \, dx = \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{1}{3}a \int \frac{x^6 \cot^{-1}(ax)}{1+a^2x^2} \, dx$$
$$= \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{\int x^4 \cot^{-1}(ax) \, dx}{3a} - \frac{\int \frac{x^4 \cot^{-1}(ax)}{1+a^2x^2} \, dx}{3a}$$
$$= \frac{x^5 \cot^{-1}(ax)}{15a} + \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{1}{15} \int \frac{x^5}{1+a^2x^2} \, dx - \frac{\int x^2 \cot^{-1}(ax) \, dx}{3a^3} + \frac{\int \frac{x^2 \cot^{-1}(ax)}{1+a^2x^2} \, dx}{3a^3}$$
$$= -\frac{x^3 \cot^{-1}(ax)}{9a^3} + \frac{x^5 \cot^{-1}(ax)}{15a} + \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{1}{30} \text{Subst}\left(\int \frac{x^2}{1+a^2x} \, dx, x, x^2\right) + \frac{\int \cot^{-1}(ax)}{3a^5}$$
$$= \frac{x \cot^{-1}(ax)}{3a^5} - \frac{x^3 \cot^{-1}(ax)}{9a^3} + \frac{x^5 \cot^{-1}(ax)}{15a} + \frac{\cot^{-1}(ax)^2}{6a^6} + \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{1}{30} \text{Subst}\left(\int \left(-\frac{1}{a^4}\right.\right.$$
$$= -\frac{x^2}{30a^4} + \frac{x^4}{60a^2} + \frac{x \cot^{-1}(ax)}{3a^5} - \frac{x^3 \cot^{-1}(ax)}{9a^3} + \frac{x^5 \cot^{-1}(ax)}{15a} + \frac{\cot^{-1}(ax)^2}{6a^6} + \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{\text{lo}}{}$$
$$= -\frac{4x^2}{45a^4} + \frac{x^4}{60a^2} + \frac{x \cot^{-1}(ax)}{3a^5} - \frac{x^3 \cot^{-1}(ax)}{9a^3} + \frac{x^5 \cot^{-1}(ax)}{15a} + \frac{\cot^{-1}(ax)^2}{6a^6} + \frac{1}{6}x^6 \cot^{-1}(ax)^2 + \frac{2}{}$$

Mathematica [A] time = 0.0228788, size = 79, normalized size = 0.76

$$\frac{3a^4x^4 - 16a^2x^2 + 46\log\left(a^2x^2+1\right) + 4ax\left(3a^4x^4 - 5a^2x^2 + 15\right)\cot^{-1}(ax) + 30\left(a^6x^6+1\right)\cot^{-1}(ax)^2}{180a^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*ArcCot[a*x]^2,x]
```

```
[Out] (-16*a^2*x^2 + 3*a^4*x^4 + 4*a*x*(15 - 5*a^2*x^2 + 3*a^4*x^4)*ArcCot[a*x] +
 30*(1 + a^6*x^6)*ArcCot[a*x]^2 + 46*Log[1 + a^2*x^2])/(180*a^6)
```

Maple [A] time = 0.049, size = 102, normalized size = 1.

$$\frac{x^6 (\text{arccot}\,(ax))^2}{6} + \frac{x^5 \text{arccot}\,(ax)}{15\,a} - \frac{x^3 \text{arccot}\,(ax)}{9\,a^3} + \frac{x \text{arccot}\,(ax)}{3\,a^5} - \frac{\text{arccot}\,(ax)\arctan(ax)}{3\,a^6} + \frac{x^4}{60\,a^2} - \frac{4\,x^2}{45\,a^4} + \frac{23\,\text{ln}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arccot(a*x)^2,x)
```

```
[Out] 1/6*x^6*arccot(a*x)^2+1/15*x^5*arccot(a*x)/a-1/9*x^3*arccot(a*x)/a^3+1/3*x*
arccot(a*x)/a^5-1/3/a^6*arccot(a*x)*arctan(a*x)+1/60*x^4/a^2-4/45*x^2/a^4+2
3/90*ln(a^2*x^2+1)/a^6-1/6/a^6*arctan(a*x)^2
```

Maxima [A] time = 1.52281, size = 128, normalized size = 1.23

$$\frac{1}{6}x^6 \operatorname{arccot}(ax)^2 + \frac{1}{45}a\left(\frac{3a^4x^5 - 5a^2x^3 + 15x}{a^6} - \frac{15\arctan(ax)}{a^7}\right)\operatorname{arccot}(ax) + \frac{3a^4x^4 - 16a^2x^2 - 30\arctan(ax)^2 + 4}{180a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/6*x^6*arccot(a*x)^2 + 1/45*a*((3*a^4*x^5 - 5*a^2*x^3 + 15*x)/a^6 - 15*arc
tan(a*x)/a^7)*arccot(a*x) + 1/180*(3*a^4*x^4 - 16*a^2*x^2 - 30*arctan(a*x)^
2 + 46*log(a^2*x^2 + 1))/a^6
```

Fricas [A] time = 1.98936, size = 189, normalized size = 1.82

$$\frac{3a^4x^4 - 16a^2x^2 + 30\left(a^6x^6 + 1\right)\operatorname{arccot}(ax)^2 + 4\left(3a^5x^5 - 5a^3x^3 + 15ax\right)\operatorname{arccot}(ax) + 46\log\left(a^2x^2 + 1\right)}{180a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/180*(3*a^4*x^4 - 16*a^2*x^2 + 30*(a^6*x^6 + 1)*arccot(a*x)^2 + 4*(3*a^5*x
^5 - 5*a^3*x^3 + 15*a*x)*arccot(a*x) + 46*log(a^2*x^2 + 1))/a^6
```

Sympy [A] time = 2.48021, size = 104, normalized size = 1.

$$\begin{cases} \frac{x^6\operatorname{acot}^2(ax)}{6} + \frac{x^5\operatorname{acot}(ax)}{15a} + \frac{x^4}{60a^2} - \frac{x^3\operatorname{acot}(ax)}{9a^3} - \frac{4x^2}{45a^4} + \frac{x\operatorname{acot}(ax)}{3a^5} + \frac{23\log\left(a^2x^2+1\right)}{90a^6} + \frac{\operatorname{acot}^2(ax)}{6a^6} & \text{for } a \neq 0 \\ \frac{\pi^2x^6}{24} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*acot(a*x)**2,x)
```

```
[Out] Piecewise((x**6*acot(a*x)**2/6 + x**5*acot(a*x)/(15*a) + x**4/(60*a**2) - x
**3*acot(a*x)/(9*a**3) - 4*x**2/(45*a**4) + x*acot(a*x)/(3*a**5) + 23*log(a
**2*x**2 + 1)/(90*a**6) + acot(a*x)**2/(6*a**6), Ne(a, 0)), (pi**2*x**6/24,
 True))
```

Giac [A] time = 1.11885, size = 190, normalized size = 1.83

$$\frac{1}{6}x^6\arctan\left(\frac{1}{ax}\right)^2+\frac{12a^5ix^5\log\left(\frac{ax-i}{ax+i}\right)+6a^4x^4-20a^3ix^3\log\left(\frac{ax-i}{ax+i}\right)-32a^2x^2+60aix\log\left(\frac{ax-i}{ax+i}\right)-15\log\left(\frac{ax-i}{ax+i}\right)^2+9}{360a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] 1/6*x^6*arctan(1/(a*x))^2 + 1/360*(12*a^5*i*x^5*log((a*x - i)/(a*x + i)) +
6*a^4*x^4 - 20*a^3*i*x^3*log((a*x - i)/(a*x + i)) - 32*a^2*x^2 + 60*a*i*x*l
og((a*x - i)/(a*x + i)) - 15*log((a*x - i)/(a*x + i))^2 + 92*log(a^2*x^2 +
1))/a^6
```

3.13 $\int x^4 \cot^{-1}(ax)^2\,dx$

Optimal. Leaf size=135

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{5a^5}+\frac{x^3}{30a^2}-\frac{x^2\cot^{-1}(ax)}{5a^3}-\frac{3x}{10a^4}+\frac{3\tan^{-1}(ax)}{10a^5}+\frac{i\cot^{-1}(ax)^2}{5a^5}-\frac{2\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{5a^5}+\frac{1}{5}x^5\,\text{co}$$

```
[Out] (-3*x)/(10*a^4) + x^3/(30*a^2) - (x^2*ArcCot[a*x])/(5*a^3) + (x^4*ArcCot[a*
x])/(10*a) + ((I/5)*ArcCot[a*x]^2)/a^5 + (x^5*ArcCot[a*x]^2)/5 + (3*ArcTan[
a*x])/(10*a^5) - (2*ArcCot[a*x]*Log[2/(1 + I*a*x)])/(5*a^5) + ((I/5)*PolyLo
g[2, 1 - 2/(1 + I*a*x)])/a^5
```

Rubi [A] time = 0.210867, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 9, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.9, Rules used = {4853, 4917, 302, 203, 321, 4921, 4855, 2402, 2315}

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{5a^5}+\frac{x^3}{30a^2}-\frac{x^2\cot^{-1}(ax)}{5a^3}-\frac{3x}{10a^4}+\frac{3\tan^{-1}(ax)}{10a^5}+\frac{i\cot^{-1}(ax)^2}{5a^5}-\frac{2\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{5a^5}+\frac{1}{5}x^5\,\text{co}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*ArcCot[a*x]^2,x]
```

```
[Out] (-3*x)/(10*a^4) + x^3/(30*a^2) - (x^2*ArcCot[a*x])/(5*a^3) + (x^4*ArcCot[a*
x])/(10*a) + ((I/5)*ArcCot[a*x]^2)/a^5 + (x^5*ArcCot[a*x]^2)/5 + (3*ArcTan[
a*x])/(10*a^5) - (2*ArcCot[a*x]*Log[2/(1 + I*a*x)])/(5*a^5) + ((I/5)*PolyLo
g[2, 1 - 2/(1 + I*a*x)])/a^5
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
```

```
e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int x^4 \cot^{-1}(ax)^2\,dx = \frac{1}{5}x^5\cot^{-1}(ax)^2 + \frac{1}{5}(2a)\int \frac{x^5\cot^{-1}(ax)}{1+a^2x^2}\,dx$$

$$= \frac{1}{5}x^5\cot^{-1}(ax)^2 + \frac{2\int x^3\cot^{-1}(ax)\,dx}{5a} - \frac{2\int \frac{x^3\cot^{-1}(ax)}{1+a^2x^2}\,dx}{5a}$$

$$= \frac{x^4\cot^{-1}(ax)}{10a} + \frac{1}{5}x^5\cot^{-1}(ax)^2 + \frac{1}{10}\int \frac{x^4}{1+a^2x^2}\,dx - \frac{2\int x\cot^{-1}(ax)\,dx}{5a^3} + \frac{2\int \frac{x\cot^{-1}(ax)}{1+a^2x^2}\,dx}{5a^3}$$

$$= -\frac{x^2\cot^{-1}(ax)}{5a^3} + \frac{x^4\cot^{-1}(ax)}{10a} + \frac{i\cot^{-1}(ax)^2}{5a^5} + \frac{1}{5}x^5\cot^{-1}(ax)^2 + \frac{1}{10}\int\left(-\frac{1}{a^4} + \frac{x^2}{a^2} + \frac{1}{a^4\left(1+a^2x^2\right)}\right.$$

$$= -\frac{3x}{10a^4} + \frac{x^3}{30a^2} - \frac{x^2\cot^{-1}(ax)}{5a^3} + \frac{x^4\cot^{-1}(ax)}{10a} + \frac{i\cot^{-1}(ax)^2}{5a^5} + \frac{1}{5}x^5\cot^{-1}(ax)^2 - \frac{2\cot^{-1}(ax)\log\left(\right.}{5a^5}$$

$$= -\frac{3x}{10a^4} + \frac{x^3}{30a^2} - \frac{x^2\cot^{-1}(ax)}{5a^3} + \frac{x^4\cot^{-1}(ax)}{10a} + \frac{i\cot^{-1}(ax)^2}{5a^5} + \frac{1}{5}x^5\cot^{-1}(ax)^2 + \frac{3\tan^{-1}(ax)}{10a^5} - \frac{2}{}$$

$$= -\frac{3x}{10a^4} + \frac{x^3}{30a^2} - \frac{x^2\cot^{-1}(ax)}{5a^3} + \frac{x^4\cot^{-1}(ax)}{10a} + \frac{i\cot^{-1}(ax)^2}{5a^5} + \frac{1}{5}x^5\cot^{-1}(ax)^2 + \frac{3\tan^{-1}(ax)}{10a^5} - \frac{2}{}$$

Mathematica [A] time = 0.501046, size = 95, normalized size = 0.7

$$\frac{6i\text{PolyLog}\left(2,e^{2i\cot^{-1}(ax)}\right) + ax\left(a^2x^2-9\right) + 6\left(a^5x^5+i\right)\cot^{-1}(ax)^2 + 3\cot^{-1}(ax)\left(a^4x^4-2a^2x^2-4\log\left(1-e^{2i\cot^{-1}(ax)}\right)\right.}{30a^5}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^4*ArcCot[a*x]^2,x]
```

```
[Out] (a*x*(-9 + a^2*x^2) + 6*(I + a^5*x^5)*ArcCot[a*x]^2 + 3*ArcCot[a*x]*(-3 - 2
*a^2*x^2 + a^4*x^4 - 4*Log[1 - E^((2*I)*ArcCot[a*x])]) + (6*I)*PolyLog[2, E
^((2*I)*ArcCot[a*x])])/(30*a^5)
```

Maple [B] time = 0.121, size = 233, normalized size = 1.7

$$\frac{x^5(\operatorname{arccot}(ax))^2}{5}+\frac{x^4\operatorname{arccot}(ax)}{10a}-\frac{x^2\operatorname{arccot}(ax)}{5a^3}+\frac{\operatorname{arccot}(ax)\ln\left(a^2x^2+1\right)}{5a^5}+\frac{x^3}{30a^2}-\frac{3x}{10a^4}+\frac{3\arctan(ax)}{10a^5}+\frac{i}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arccot(a*x)^2,x)
```

```
[Out] 1/5*x^5*arccot(a*x)^2+1/10*x^4*arccot(a*x)/a-1/5*x^2*arccot(a*x)/a^3+1/5/a^
5*arccot(a*x)*ln(a^2*x^2+1)+1/30*x^3/a^2-3/10*x/a^4+3/10*arctan(a*x)/a^5+1/
20*I/a^5*ln(a*x-I)^2+1/10*I/a^5*ln(a*x-I)*ln(-1/2*I*(a*x+I))-1/10*I/a^5*ln(
a*x-I)*ln(a^2*x^2+1)+1/10*I/a^5*dilog(-1/2*I*(a*x+I))-1/20*I/a^5*ln(a*x+I)^
2-1/10*I/a^5*ln(a*x+I)*ln(1/2*I*(a*x-I))+1/10*I/a^5*ln(a*x+I)*ln(a^2*x^2+1)
-1/10*I/a^5*dilog(1/2*I*(a*x-I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{20}x^5\arctan(1,ax)^2-\frac{1}{80}x^5\log\left(a^2x^2+1\right)^2+\int\frac{60a^2x^6\arctan(1,ax)^2+4a^2x^6\log\left(a^2x^2+1\right)+8ax^5\arctan(1,ax)}{80\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/20*x^5*arctan2(1, a*x)^2 - 1/80*x^5*log(a^2*x^2 + 1)^2 + integrate(1/80*(
60*a^2*x^6*arctan2(1, a*x)^2 + 4*a^2*x^6*log(a^2*x^2 + 1) + 8*a*x^5*arctan2
(1, a*x) + 60*x^4*arctan2(1, a*x)^2 + 5*(a^2*x^6 + x^4)*log(a^2*x^2 + 1)^2)
/(a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(x^4\operatorname{arccot}(ax)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(x^4*arccot(a*x)^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^4 \operatorname{acot}^2(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*acot(a*x)**2,x)
```

```
[Out] Integral(x**4*acot(a*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^4 \operatorname{arccot}(ax)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(x^4*arccot(a*x)^2, x)
```

3.14 $\int x^3 \cot^{-1}(ax)^2 \, dx$

Optimal. Leaf size=80

$$\frac{x^2}{12a^2} - \frac{\log\left(a^2x^2+1\right)}{3a^4} - \frac{x\cot^{-1}(ax)}{2a^3} - \frac{\cot^{-1}(ax)^2}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^2 + \frac{x^3\cot^{-1}(ax)}{6a}$$

```
[Out] x^2/(12*a^2) - (x*ArcCot[a*x])/(2*a^3) + (x^3*ArcCot[a*x])/(6*a) - ArcCot[a
*x]^2/(4*a^4) + (x^4*ArcCot[a*x]^2)/4 - Log[1 + a^2*x^2]/(3*a^4)
```

Rubi [A] time = 0.145659, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {4853, 4917, 266, 43, 4847, 260, 4885}

$$\frac{x^2}{12a^2} - \frac{\log\left(a^2x^2+1\right)}{3a^4} - \frac{x\cot^{-1}(ax)}{2a^3} - \frac{\cot^{-1}(ax)^2}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^2 + \frac{x^3\cot^{-1}(ax)}{6a}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcCot[a*x]^2,x]
```

```
[Out] x^2/(12*a^2) - (x*ArcCot[a*x])/(2*a^3) + (x^3*ArcCot[a*x])/(6*a) - ArcCot[a
*x]^2/(4*a^4) + (x^4*ArcCot[a*x]^2)/4 - Log[1 + a^2*x^2]/(3*a^4)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int x^3 \cot^{-1}(ax)^2\,dx = \frac{1}{4}x^4\cot^{-1}(ax)^2 + \frac{1}{2}a\int \frac{x^4\cot^{-1}(ax)}{1+a^2x^2}\,dx$$
$$= \frac{1}{4}x^4\cot^{-1}(ax)^2 + \frac{\int x^2\cot^{-1}(ax)\,dx}{2a} - \frac{\int \frac{x^2\cot^{-1}(ax)}{1+a^2x^2}\,dx}{2a}$$
$$= \frac{x^3\cot^{-1}(ax)}{6a} + \frac{1}{4}x^4\cot^{-1}(ax)^2 + \frac{1}{6}\int \frac{x^3}{1+a^2x^2}\,dx - \frac{\int \cot^{-1}(ax)\,dx}{2a^3} + \frac{\int \frac{\cot^{-1}(ax)}{1+a^2x^2}\,dx}{2a^3}$$
$$= -\frac{x\cot^{-1}(ax)}{2a^3} + \frac{x^3\cot^{-1}(ax)}{6a} - \frac{\cot^{-1}(ax)^2}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^2 + \frac{1}{12}\operatorname{Subst}\left(\int \frac{x}{1+a^2x}\,dx, x, x^2\right) -$$
$$= -\frac{x\cot^{-1}(ax)}{2a^3} + \frac{x^3\cot^{-1}(ax)}{6a} - \frac{\cot^{-1}(ax)^2}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^2 - \frac{\log\left(1+a^2x^2\right)}{4a^4} + \frac{1}{12}\operatorname{Subst}\left(\int\left(\right.\right.$$
$$= \frac{x^2}{12a^2} - \frac{x\cot^{-1}(ax)}{2a^3} + \frac{x^3\cot^{-1}(ax)}{6a} - \frac{\cot^{-1}(ax)^2}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^2 - \frac{\log\left(1+a^2x^2\right)}{3a^4}$$

Mathematica [A] time = 0.0203256, size = 61, normalized size = 0.76

$$\frac{a^2x^2 - 4\log\left(a^2x^2+1\right) + 2ax\left(a^2x^2-3\right)\cot^{-1}(ax) + 3\left(a^4x^4-1\right)\cot^{-1}(ax)^2}{12a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*ArcCot[a*x]^2,x]
```

```
[Out] (a^2*x^2 + 2*a*x*(-3 + a^2*x^2)*ArcCot[a*x] + 3*(-1 + a^4*x^4)*ArcCot[a*x]^
2 - 4*Log[1 + a^2*x^2])/(12*a^4)
```

Maple [A] time = 0.051, size = 82, normalized size = 1.

$$\frac{x^4(\operatorname{arccot}(ax))^2}{4} + \frac{x^3\operatorname{arccot}(ax)}{6a} - \frac{x\operatorname{arccot}(ax)}{2a^3} + \frac{\operatorname{arccot}(ax)\arctan(ax)}{2a^4} + \frac{x^2}{12a^2} - \frac{\ln\left(a^2x^2+1\right)}{3a^4} + \frac{(\arctan(ax))^2}{4a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(a*x)^2,x)
```

```
[Out] 1/4*x^4*arccot(a*x)^2+1/6*x^3*arccot(a*x)/a-1/2*x*arccot(a*x)/a^3+1/2/a^4*a
rccot(a*x)*arctan(a*x)+1/12*x^2/a^2-1/3*ln(a^2*x^2+1)/a^4+1/4/a^4*arctan(a*
```

```
x)^2
```

Maxima [A] time = 1.54347, size = 104, normalized size = 1.3

$$\frac{1}{4}\,x^4\,\mathrm{arccot}\,(ax)^2+\frac{1}{6}\,a\left(\frac{a^2x^3-3\,x}{a^4}+\frac{3\,\arctan\,(ax)}{a^5}\right)\mathrm{arccot}\,(ax)+\frac{a^2x^2+3\,\arctan\,(ax)^2-4\,\log\left(a^2x^2+1\right)}{12\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x^4*arccot(a*x)^2 + 1/6*a*((a^2*x^3 - 3*x)/a^4 + 3*arctan(a*x)/a^5)*arc
cot(a*x) + 1/12*(a^2*x^2 + 3*arctan(a*x)^2 - 4*log(a^2*x^2 + 1))/a^4
```

Fricas [A] time = 1.91668, size = 144, normalized size = 1.8

$$\frac{a^2x^2+3\left(a^4x^4-1\right)\mathrm{arccot}\,(ax)^2+2\left(a^3x^3-3\,ax\right)\mathrm{arccot}\,(ax)-4\,\log\left(a^2x^2+1\right)}{12\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/12*(a^2*x^2 + 3*(a^4*x^4 - 1)*arccot(a*x)^2 + 2*(a^3*x^3 - 3*a*x)*arccot(
a*x) - 4*log(a^2*x^2 + 1))/a^4
```

Sympy [A] time = 1.3269, size = 78, normalized size = 0.98

$$\begin{cases}\frac{x^4\,\mathrm{acot}^2\,(ax)}{4}+\frac{x^3\,\mathrm{acot}\,(ax)}{6a}+\frac{x^2}{12a^2}-\frac{x\,\mathrm{acot}\,(ax)}{2a^3}-\frac{\log\left(a^2x^2+1\right)}{3a^4}-\frac{\mathrm{acot}^2\,(ax)}{4a^4} & \text{for } a\neq 0\\ \frac{\pi^2x^4}{16} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(a*x)**2,x)
```

```
[Out] Piecewise((x**4*acot(a*x)**2/4 + x**3*acot(a*x)/(6*a) + x**2/(12*a**2) - x*
acot(a*x)/(2*a**3) - log(a**2*x**2 + 1)/(3*a**4) - acot(a*x)**2/(4*a**4), N
e(a, 0)), (pi**2*x**4/16, True))
```

Giac [A] time = 1.13697, size = 146, normalized size = 1.82

$$\frac{1}{4}x^4\arctan\left(\frac{1}{ax}\right)^2+\frac{4\,a^3ix^3\log\left(\frac{ax-i}{ax+i}\right)+4\,a^2x^2-12\,aix\log\left(\frac{ax-i}{ax+i}\right)+3\,\log\left(\frac{ax-i}{ax+i}\right)^2-16\,\log\left(a^2x^2+1\right)}{48\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] 1/4*x^4*arctan(1/(a*x))^2 + 1/48*(4*a^3*i*x^3*log((a*x - i)/(a*x + i)) + 4*
a^2*x^2 - 12*a*i*x*log((a*x - i)/(a*x + i)) + 3*log((a*x - i)/(a*x + i))^2
- 16*log(a^2*x^2 + 1))/a^4
```

3.15 $\int x^2 \cot^{-1}(ax)^2\,dx$

Optimal. Leaf size=111

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{3a^3}+\frac{x}{3a^2}-\frac{\tan^{-1}(ax)}{3a^3}-\frac{i\cot^{-1}(ax)^2}{3a^3}+\frac{2\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{3a^3}+\frac{1}{3}x^3\cot^{-1}(ax)^2+\frac{x^2\cot^{-1}(ax)}{3a}$$

```
[Out] x/(3*a^2) + (x^2*ArcCot[a*x])/(3*a) - ((I/3)*ArcCot[a*x]^2)/a^3 + (x^3*ArcC
ot[a*x]^2)/3 - ArcTan[a*x]/(3*a^3) + (2*ArcCot[a*x]*Log[2/(1 + I*a*x)])/(3*
a^3) - ((I/3)*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^3
```

Rubi [A] time = 0.140106, antiderivative size = 111, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8, Rules used = {4853, 4917, 321, 203, 4921, 4855, 2402, 2315}

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{3a^3}+\frac{x}{3a^2}-\frac{\tan^{-1}(ax)}{3a^3}-\frac{i\cot^{-1}(ax)^2}{3a^3}+\frac{2\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{3a^3}+\frac{1}{3}x^3\cot^{-1}(ax)^2+\frac{x^2\cot^{-1}(ax)}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[a*x]^2,x]
```

```
[Out] x/(3*a^2) + (x^2*ArcCot[a*x])/(3*a) - ((I/3)*ArcCot[a*x]^2)/a^3 + (x^3*ArcC
ot[a*x]^2)/3 - ArcTan[a*x]/(3*a^3) + (2*ArcCot[a*x]*Log[2/(1 + I*a*x)])/(3*
a^3) - ((I/3)*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^3
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int x^2 \cot^{-1}(ax)^2 \, dx = \frac{1}{3}x^3 \cot^{-1}(ax)^2 + \frac{1}{3}(2a) \int \frac{x^3 \cot^{-1}(ax)}{1+a^2x^2} \, dx$$

$$= \frac{1}{3}x^3 \cot^{-1}(ax)^2 + \frac{2\int x \cot^{-1}(ax) \, dx}{3a} - \frac{2\int \frac{x \cot^{-1}(ax)}{1+a^2x^2} \, dx}{3a}$$

$$= \frac{x^2 \cot^{-1}(ax)}{3a} - \frac{i \cot^{-1}(ax)^2}{3a^3} + \frac{1}{3}x^3 \cot^{-1}(ax)^2 + \frac{1}{3}\int \frac{x^2}{1+a^2x^2} \, dx + \frac{2\int \frac{\cot^{-1}(ax)}{i-ax} \, dx}{3a^2}$$

$$= \frac{x}{3a^2} + \frac{x^2 \cot^{-1}(ax)}{3a} - \frac{i \cot^{-1}(ax)^2}{3a^3} + \frac{1}{3}x^3 \cot^{-1}(ax)^2 + \frac{2\cot^{-1}(ax) \log\left(\frac{2}{1+iax}\right)}{3a^3} - \frac{\int \frac{1}{1+a^2x^2} \, dx}{3a^2} + \frac{2\int}{}$$

$$= \frac{x}{3a^2} + \frac{x^2 \cot^{-1}(ax)}{3a} - \frac{i \cot^{-1}(ax)^2}{3a^3} + \frac{1}{3}x^3 \cot^{-1}(ax)^2 - \frac{\tan^{-1}(ax)}{3a^3} + \frac{2\cot^{-1}(ax) \log\left(\frac{2}{1+iax}\right)}{3a^3} - \frac{(2i)}{}$$

$$= \frac{x}{3a^2} + \frac{x^2 \cot^{-1}(ax)}{3a} - \frac{i \cot^{-1}(ax)^2}{3a^3} + \frac{1}{3}x^3 \cot^{-1}(ax)^2 - \frac{\tan^{-1}(ax)}{3a^3} + \frac{2\cot^{-1}(ax) \log\left(\frac{2}{1+iax}\right)}{3a^3} - \frac{i\mathrm{Li}_2}{}$$

Mathematica [A] time = 0.262658, size = 76, normalized size = 0.68

$$\frac{-i\mathrm{PolyLog}\left(2, e^{2i\cot^{-1}(ax)}\right) + \left(a^3x^3 - i\right)\cot^{-1}(ax)^2 + \cot^{-1}(ax)\left(a^2x^2 + 2\log\left(1 - e^{2i\cot^{-1}(ax)}\right) + 1\right) + ax}{3a^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*ArcCot[a*x]^2,x]
```

```
[Out] (a*x + (-I + a^3*x^3)*ArcCot[a*x]^2 + ArcCot[a*x]*(1 + a^2*x^2 + 2*Log[1 -
E^((2*I)*ArcCot[a*x])]) - I*PolyLog[2, E^((2*I)*ArcCot[a*x])])/(3*a^3)
```

Maple [B] time = 0.112, size = 213, normalized size = 1.9

$$\frac{x^3 (\mathrm{arccot}\,(ax))^2}{3} + \frac{x^2 \mathrm{arccot}\,(ax)}{3\,a} - \frac{\mathrm{arccot}\,(ax) \ln\left(a^2x^2+1\right)}{3\,a^3} + \frac{x}{3\,a^2} - \frac{\arctan(ax)}{3\,a^3} - \frac{\frac{i}{12}(\ln(ax-i))^2}{a^3} - \frac{\frac{i}{6}\ln(ax-i)\ln}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(a*x)^2,x)
```

```
[Out] 1/3*x^3*arccot(a*x)^2+1/3*x^2*arccot(a*x)/a-1/3/a^3*arccot(a*x)*ln(a^2*x^2+
1)+1/3*x/a^2-1/3*arctan(a*x)/a^3-1/12*I/a^3*ln(a*x-I)^2-1/6*I/a^3*ln(a*x-I)
*ln(-1/2*I*(a*x+I))+1/6*I/a^3*ln(a*x-I)*ln(a^2*x^2+1)-1/6*I/a^3*dilog(-1/2*
I*(a*x+I))+1/12*I/a^3*ln(a*x+I)^2+1/6*I/a^3*ln(a*x+I)*ln(1/2*I*(a*x-I))-1/6
*I/a^3*ln(a*x+I)*ln(a^2*x^2+1)+1/6*I/a^3*dilog(1/2*I*(a*x-I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{12}\,x^3\arctan\left(1,ax\right)^2-\frac{1}{48}\,x^3\log\left(a^2x^2+1\right)^2+\int\frac{36\,a^2x^4\arctan\left(1,ax\right)^2+4\,a^2x^4\log\left(a^2x^2+1\right)+8\,ax^3\arctan\left(1,ax\right)}{48\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/12*x^3*arctan2(1, a*x)^2 - 1/48*x^3*log(a^2*x^2 + 1)^2 + integrate(1/48*(
36*a^2*x^4*arctan2(1, a*x)^2 + 4*a^2*x^4*log(a^2*x^2 + 1) + 8*a*x^3*arctan2
(1, a*x) + 36*x^2*arctan2(1, a*x)^2 + 3*(a^2*x^4 + x^2)*log(a^2*x^2 + 1)^2)
/(a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^2\operatorname{arccot}\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(x^2*arccot(a*x)^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\operatorname{acot}^2\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(a*x)**2,x)
```

```
[Out] Integral(x**2*acot(a*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(ax)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(a*x)^2, x)
```

3.16 $\int x \cot^{-1}(ax)^2 \, dx$

Optimal. Leaf size=53

$$\frac{\log\left(a^2x^2+1\right)}{2a^2}+\frac{\cot^{-1}(ax)^2}{2a^2}+\frac{1}{2}x^2\cot^{-1}(ax)^2+\frac{x\cot^{-1}(ax)}{a}$$

```
[Out] (x*ArcCot[a*x])/a + ArcCot[a*x]^2/(2*a^2) + (x^2*ArcCot[a*x]^2)/2 + Log[1 +
 a^2*x^2]/(2*a^2)
```

Rubi [A] time = 0.0719063, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4853, 4917, 4847, 260, 4885}

$$\frac{\log\left(a^2x^2+1\right)}{2a^2}+\frac{\cot^{-1}(ax)^2}{2a^2}+\frac{1}{2}x^2\cot^{-1}(ax)^2+\frac{x\cot^{-1}(ax)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[a*x]^2,x]
```


```
[Out] (x*ArcCot[a*x])/a + ArcCot[a*x]^2/(2*a^2) + (x^2*ArcCot[a*x]^2)/2 + Log[1 +
 a^2*x^2]/(2*a^2)
```


Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int x\cot^{-1}(ax)^2\,dx &= \frac{1}{2}x^2\cot^{-1}(ax)^2 + a\int\frac{x^2\cot^{-1}(ax)}{1+a^2x^2}\,dx \\
&= \frac{1}{2}x^2\cot^{-1}(ax)^2 + \frac{\int\cot^{-1}(ax)\,dx}{a} - \frac{\int\frac{\cot^{-1}(ax)}{1+a^2x^2}\,dx}{a} \\
&= \frac{x\cot^{-1}(ax)}{a} + \frac{\cot^{-1}(ax)^2}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^2 + \int\frac{x}{1+a^2x^2}\,dx \\
&= \frac{x\cot^{-1}(ax)}{a} + \frac{\cot^{-1}(ax)^2}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^2 + \frac{\log\left(1+a^2x^2\right)}{2a^2}
\end{aligned}$$

Mathematica [A] time = 0.0131157, size = 42, normalized size = 0.79

$$\frac{\log\left(a^2x^2+1\right)+\left(a^2x^2+1\right)\cot^{-1}(ax)^2+2ax\cot^{-1}(ax)}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[a*x]^2,x]
```

```
[Out] (2*a*x*ArcCot[a*x] + (1 + a^2*x^2)*ArcCot[a*x]^2 + Log[1 + a^2*x^2])/(2*a^2
)
```

Maple [A] time = 0.048, size = 61, normalized size = 1.2

$$\frac{x^2 (\operatorname{arccot}(ax))^2}{2} - \frac{\operatorname{arccot}(ax)\arctan(ax)}{a^2} + \frac{x\operatorname{arccot}(ax)}{a} + \frac{\ln(a^2x^2+1)}{2a^2} - \frac{(\arctan(ax))^2}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(a*x)^2,x)
```

```
[Out] 1/2*x^2*arccot(a*x)^2-1/a^2*arccot(a*x)*arctan(a*x)+x*arccot(a*x)/a+1/2*ln(
a^2*x^2+1)/a^2-1/2/a^2*arctan(a*x)^2
```

Maxima [A] time = 1.53683, size = 77, normalized size = 1.45

$$\frac{1}{2}x^2\operatorname{arccot}(ax)^2 + a\left(\frac{x}{a^2} - \frac{\arctan(ax)}{a^3}\right)\operatorname{arccot}(ax) - \frac{\arctan(ax)^2 - \log(a^2x^2+1)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arccot(a*x)^2 + a*(x/a^2 - arctan(a*x)/a^3)*arccot(a*x) - 1/2*(arct
an(a*x)^2 - log(a^2*x^2 + 1))/a^2
```

Fricas [A] time = 1.74942, size = 105, normalized size = 1.98

$$\frac{2ax\operatorname{arccot}(ax) + (a^2x^2+1)\operatorname{arccot}(ax)^2 + \log(a^2x^2+1)}{2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a*x*arccot(a*x) + (a^2*x^2 + 1)*arccot(a*x)^2 + log(a^2*x^2 + 1))/a^
2
```

Sympy [A] time = 0.645709, size = 54, normalized size = 1.02

$$\begin{cases} \frac{x^2\operatorname{acot}^2(ax)}{2} + \frac{x\operatorname{acot}(ax)}{a} + \frac{\log(a^2x^2+1)}{2a^2} + \frac{\operatorname{acot}^2(ax)}{2a^2} & \text{for } a \neq 0 \\ \frac{\pi^2x^2}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(a*x)**2,x)
```

```
[Out] Piecewise((x**2*acot(a*x)**2/2 + x*acot(a*x)/a + log(a**2*x**2 + 1)/(2*a**2
) + acot(a*x)**2/(2*a**2), Ne(a, 0)), (pi**2*x**2/8, True))
```

Giac [A] time = 1.12203, size = 101, normalized size = 1.91

$$\frac{1}{2}x^2\arctan\left(\frac{1}{ax}\right)^2 + \frac{4\,aix\log\left(\frac{ax-i}{ax+i}\right) - \log\left(\frac{ax-i}{ax+i}\right)^2 + 4\,\log\left(a^2x^2+1\right)}{8\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] 1/2*x^2*arctan(1/(a*x))^2 + 1/8*(4*a*i*x*log((a*x - i)/(a*x + i)) - log((a*
x - i)/(a*x + i))^2 + 4*log(a^2*x^2 + 1))/a^2
```

3.17 $\int \cot^{-1}(ax)^2\,dx$

Optimal. Leaf size=67

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a}+x\cot^{-1}(ax)^2+\frac{i\cot^{-1}(ax)^2}{a}-\frac{2\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{a}$$

```
[Out] (I*ArcCot[a*x]^2)/a + x*ArcCot[a*x]^2 - (2*ArcCot[a*x]*Log[2/(1 + I*a*x)])/
a + (I*PolyLog[2, 1 - 2/(1 + I*a*x)])/a
```

Rubi [A] time = 0.074329, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.833, Rules used = {4847, 4921, 4855, 2402, 2315}

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a}+x\cot^{-1}(ax)^2+\frac{i\cot^{-1}(ax)^2}{a}-\frac{2\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^2,x]
```

```
[Out] (I*ArcCot[a*x]^2)/a + x*ArcCot[a*x]^2 - (2*ArcCot[a*x]*Log[2/(1 + I*a*x)])/
a + (I*PolyLog[2, 1 - 2/(1 + I*a*x)])/a
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
```

```
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$
\begin{aligned}
\int \cot^{-1}(ax)^2\,dx &= x\cot^{-1}(ax)^2 + (2a)\int \frac{x\cot^{-1}(ax)}{1+a^2x^2}\,dx \\
&= \frac{i\cot^{-1}(ax)^2}{a} + x\cot^{-1}(ax)^2 - 2\int \frac{\cot^{-1}(ax)}{i-ax}\,dx \\
&= \frac{i\cot^{-1}(ax)^2}{a} + x\cot^{-1}(ax)^2 - \frac{2\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a} - 2\int \frac{\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx \\
&= \frac{i\cot^{-1}(ax)^2}{a} + x\cot^{-1}(ax)^2 - \frac{2\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a} + \frac{(2i)\,\mathrm{Subst}\left(\int \frac{\log(2x)}{1-2x}\,dx, x, \frac{1}{1+iax}\right)}{a} \\
&= \frac{i\cot^{-1}(ax)^2}{a} + x\cot^{-1}(ax)^2 - \frac{2\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a} + \frac{i\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{a}
\end{aligned}
$$

Mathematica [A] time = 0.0758582, size = 56, normalized size = 0.84

$$
\frac{i\mathrm{PolyLog}\left(2, e^{2i\cot^{-1}(ax)}\right) + \cot^{-1}(ax)\left((ax+i)\cot^{-1}(ax) - 2\log\left(1-e^{2i\cot^{-1}(ax)}\right)\right)}{a}
$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^2,x]
```

```
[Out] (ArcCot[a*x]*((I + a*x)*ArcCot[a*x] - 2*Log[1 - E^((2*I)*ArcCot[a*x])]) + I
*PolyLog[2, E^((2*I)*ArcCot[a*x])])/a
```

Maple [B] time = 0.164, size = 136, normalized size = 2.

$$x(\operatorname{arccot}(ax))^2+\frac{i(\operatorname{arccot}(ax))^2}{a}+\frac{2i}{a}\operatorname{polylog}\left(2,-(ax+i)\frac{1}{\sqrt{a^2x^2+1}}\right)+\frac{2i}{a}\operatorname{polylog}\left(2,(ax+i)\frac{1}{\sqrt{a^2x^2+1}}\right)-2\,\frac{\operatorname{arcc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^2,x)
```

```
[Out] x*arccot(a*x)^2+I*arccot(a*x)^2/a+2*I/a*polylog(2,-(a*x+I)/(a^2*x^2+1)^(1/2
))+2*I/a*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))-2/a*arccot(a*x)*ln(1+(a*x+I)/
(a^2*x^2+1)^(1/2))-2/a*arccot(a*x)*ln(1-(a*x+I)/(a^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}x\arctan(1,ax)^2+12a^2\int\frac{x^2\arctan\left(\frac{1}{ax}\right)^2}{16\left(a^2x^2+1\right)}\,dx+a^2\int\frac{x^2\log\left(a^2x^2+1\right)^2}{16\left(a^2x^2+1\right)}\,dx+4a^2\int\frac{x^2\log\left(a^2x^2+1\right)}{16\left(a^2x^2+1\right)}\,dx-\frac{1}{16}x\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/4*x*arctan2(1, a*x)^2 + 12*a^2*integrate(1/16*x^2*arctan(1/(a*x))^2/(a^2*
x^2 + 1), x) + a^2*integrate(1/16*x^2*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x)
+ 4*a^2*integrate(1/16*x^2*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 1/16*x*log(
a^2*x^2 + 1)^2 + 1/4*arctan(a*x)^3/a + 3/4*arctan(a*x)^2*arctan(1/(a*x))/a
+ 3/4*arctan(a*x)*arctan(1/(a*x))^2/a + 8*a*integrate(1/16*x*arctan(1/(a*x)
)/(a^2*x^2 + 1), x) + integrate(1/16*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\operatorname{arccot}(ax)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}^2(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**2,x)
```

```
[Out] Integral(acot(a*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^2, x)
```

3.18 $\int \frac{\cot^{-1}(ax)^2}{x}\,dx$

Optimal. Leaf size=116

$$-\frac{1}{2}\text{PolyLog}\left(3,1-\frac{2i}{ax+i}\right)+\frac{1}{2}\text{PolyLog}\left(3,1-\frac{2ax}{ax+i}\right)-i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2i}{ax+i}\right)+i\cot^{-1}(ax)\text{PolyLog}\left(\right.$$

```
[Out] 2*ArcCot[a*x]^2*ArcCoth[1 - 2/(1 + I*a*x)] - I*ArcCot[a*x]*PolyLog[2, 1 - (
2*I)/(I + a*x)] + I*ArcCot[a*x]*PolyLog[2, 1 - (2*a*x)/(I + a*x)] - PolyLog
[3, 1 - (2*I)/(I + a*x)]/2 + PolyLog[3, 1 - (2*a*x)/(I + a*x)]/2
```

Rubi [A] time = 0.212925, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {4851, 4989, 4885, 4993, 6610}

$$-\frac{1}{2}\text{PolyLog}\left(3,1-\frac{2i}{ax+i}\right)+\frac{1}{2}\text{PolyLog}\left(3,1-\frac{2ax}{ax+i}\right)-i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2i}{ax+i}\right)+i\cot^{-1}(ax)\text{PolyLog}\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^2/x,x]
```

```
[Out] 2*ArcCot[a*x]^2*ArcCoth[1 - 2/(1 + I*a*x)] - I*ArcCot[a*x]*PolyLog[2, 1 - (
2*I)/(I + a*x)] + I*ArcCot[a*x]*PolyLog[2, 1 - (2*a*x)/(I + a*x)] - PolyLog
[3, 1 - (2*I)/(I + a*x)]/2 + PolyLog[3, 1 - (2*a*x)/(I + a*x)]/2
```

Rule 4851

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcCot[c*x])^p*ArcCoth[1 - 2/(1 + I*c*x)], x] + Dist[2*b*c*p, Int[((a + b
*ArcCot[c*x])^(p - 1)*ArcCoth[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4989

```
Int[(ArcCoth[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[SimplifyIntegrand[1 + 1/u, x]]*(a +
b*ArcCot[c*x])^p)/(d + e*x^2), x], x] - Dist[1/2, Int[(Log[SimplifyIntegran
d[1 - 1/u, x]]*(a + b*ArcCot[c*x])^p)/(d + e*x^2), x], x] /; FreeQ[{a, b, c
, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x
))^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4993

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] + Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^2}{x}\,dx = 2\cot^{-1}(ax)^2\coth^{-1}\left(1-\frac{2}{1+iax}\right)+(4a)\int \frac{\cot^{-1}(ax)\coth^{-1}\left(1-\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx$$

$$= 2\cot^{-1}(ax)^2\coth^{-1}\left(1-\frac{2}{1+iax}\right)-(2a)\int \frac{\cot^{-1}(ax)\log\left(\frac{2i}{i+ax}\right)}{1+a^2x^2}\,dx+(2a)\int \frac{\cot^{-1}(ax)\log\left(\frac{2ax}{i+ax}\right)}{1+a^2x^2}\,dx$$

$$= 2\cot^{-1}(ax)^2\coth^{-1}\left(1-\frac{2}{1+iax}\right)-i\cot^{-1}(ax)\text{Li}_2\left(1-\frac{2i}{i+ax}\right)+i\cot^{-1}(ax)\text{Li}_2\left(1-\frac{2ax}{i+ax}\right)-(ia)$$

$$= 2\cot^{-1}(ax)^2\coth^{-1}\left(1-\frac{2}{1+iax}\right)-i\cot^{-1}(ax)\text{Li}_2\left(1-\frac{2i}{i+ax}\right)+i\cot^{-1}(ax)\text{Li}_2\left(1-\frac{2ax}{i+ax}\right)-\frac{1}{2}\text{Li}_3$$

Mathematica [A] time = 0.0604744, size = 132, normalized size = 1.14

$$-i\cot^{-1}(ax)\text{PolyLog}\left(2,e^{-2i\cot^{-1}(ax)}\right)-i\cot^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right)-\frac{1}{2}\text{PolyLog}\left(3,e^{-2i\cot^{-1}(ax)}\right)+\frac{1}{2}\text{PolyLog}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^2/x,x]
```

```
[Out] ((-2*I)/3)*ArcCot[a*x]^3 - ArcCot[a*x]^2*Log[1 - E^((-2*I)*ArcCot[a*x])] +
ArcCot[a*x]^2*Log[1 + E^((2*I)*ArcCot[a*x])] - I*ArcCot[a*x]*PolyLog[2, E^(
(-2*I)*ArcCot[a*x])] - I*ArcCot[a*x]*PolyLog[2, -E^((2*I)*ArcCot[a*x])] - P
olyLog[3, E^((-2*I)*ArcCot[a*x])]/2 + PolyLog[3, -E^((2*I)*ArcCot[a*x])]/2
```

Maple [C] time = 0.601, size = 959, normalized size = 8.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^2/x,x)
```

```
[Out] ln(a*x)*arccot(a*x)^2+1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/
(a^2*x^2+1)+1))^3*arccot(a*x)^2-1/2*I*Pi*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*(
(a*x+I)^2/(a^2*x^2+1)+1))^3*arccot(a*x)^2+1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x
^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+
I)^2/(a^2*x^2+1)+1))*arccot(a*x)^2+2*I*arccot(a*x)*polylog(2,-(a*x+I)/(a^2*
x^2+1)^(1/2))-1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2
+1)+1))^2*csgn(I*((a*x+I)^2/(a^2*x^2+1)+1))*arccot(a*x)^2-1/2*I*Pi*csgn(I/(
(a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))*csgn(1/((a*x+I)^2/(a^2*
x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2*arccot(a*x)^2-1/2*I*Pi*arccot(a*x)^2
+1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1
)*((a*x+I)^2/(a^2*x^2+1)+1))*csgn(I*((a*x+I)^2/(a^2*x^2+1)+1))*arccot(a*x)^
2+2*I*arccot(a*x)*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))+arccot(a*x)^2*ln((a*
x+I)^2/(a^2*x^2+1)-1)-arccot(a*x)^2*ln(1-(a*x+I)/(a^2*x^2+1)^(1/2))-1/2*I*P
i*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+
I)^2/(a^2*x^2+1)+1))^2*arccot(a*x)^2-2*polylog(3,(a*x+I)/(a^2*x^2+1)^(1/2))
-arccot(a*x)^2*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2))-I*arccot(a*x)*polylog(2,-(a*
x+I)^2/(a^2*x^2+1))-2*polylog(3,-(a*x+I)/(a^2*x^2+1)^(1/2))+1/2*I*Pi*csgn(1
/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2*arccot(a*x)^2+1/2*p
olylog(3,-(a*x+I)^2/(a^2*x^2+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x,x, algorithm="maxima")
```

```
[Out] integrate(arccot(a*x)^2/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\text{arccot}\,(ax)^2}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^2/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\text{acot}^2\,(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**2/x,x)
```

```
[Out] Integral(acot(a*x)**2/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\text{arccot}\,(ax)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^2/x, x)
```

3.19 $\int \frac{\cot^{-1}(ax)^2}{x^2} dx$

Optimal. Leaf size=66

$$-ia\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-ia\cot^{-1}(ax)^2-\frac{\cot^{-1}(ax)^2}{x}-2a\log\left(2-\frac{2}{1-iax}\right)\cot^{-1}(ax)$$

```
[Out] (-I)*a*ArcCot[a*x]^2 - ArcCot[a*x]^2/x - 2*a*ArcCot[a*x]*Log[2 - 2/(1 - I*a
*x)] - I*a*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rubi [A] time = 0.105241, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {4853, 4925, 4869, 2447}

$$-ia\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-ia\cot^{-1}(ax)^2-\frac{\cot^{-1}(ax)^2}{x}-2a\log\left(2-\frac{2}{1-iax}\right)\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^2/x^2,x]
```

```
[Out] (-I)*a*ArcCot[a*x]^2 - ArcCot[a*x]^2/x - 2*a*ArcCot[a*x]*Log[2 - 2/(1 - I*a
*x)] - I*a*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}(ax)^2}{x^2}\,dx &= -\frac{\cot^{-1}(ax)^2}{x} - (2a)\int \frac{\cot^{-1}(ax)}{x\left(1+a^2x^2\right)}\,dx \\
&= -ia\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{x} - (2ia)\int \frac{\cot^{-1}(ax)}{x(i+ax)}\,dx \\
&= -ia\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{x} - 2a\cot^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right) - \left(2a^2\right)\int \frac{\log\left(2-\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx \\
&= -ia\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{x} - 2a\cot^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right) - ia\mathrm{Li}_2\left(-1+\frac{2}{1-iax}\right)
\end{aligned}
$$

Mathematica [A] time = 0.0439344, size = 64, normalized size = 0.97

$$a\left(i\mathrm{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right) - \frac{\cot^{-1}(ax)^2}{ax} + i\cot^{-1}(ax)^2 - 2\cot^{-1}(ax)\log\left(1+e^{2i\cot^{-1}(ax)}\right)\right)$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^2/x^2,x]
```

```
[Out] a*(I*ArcCot[a*x]^2 - ArcCot[a*x]^2/(a*x) - 2*ArcCot[a*x]*Log[1 + E^((2*I)*A
rcCot[a*x])] + I*PolyLog[2, -E^((2*I)*ArcCot[a*x])])
```

Maple [B] time = 0.138, size = 234, normalized size = 3.6

$$-\frac{(\operatorname{arccot}(ax))^2}{x} + a\operatorname{arccot}(ax)\ln\left(a^2x^2+1\right) - 2a\ln(ax)\operatorname{arccot}(ax) + ia\ln(ax)\ln(1+iax) - ia\ln(ax)\ln(1-iax) + i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^2/x^2,x)
```

```
[Out] -arccot(a*x)^2/x+a*arccot(a*x)*ln(a^2*x^2+1)-2*a*ln(a*x)*arccot(a*x)+I*a*ln
(a*x)*ln(1+I*a*x)-I*a*ln(a*x)*ln(1-I*a*x)+I*a*dilog(1+I*a*x)-I*a*dilog(1-I*
a*x)+1/4*I*a*ln(a*x-I)^2+1/2*I*a*ln(a*x-I)*ln(-1/2*I*(a*x+I))-1/2*I*a*ln(a*
x-I)*ln(a^2*x^2+1)+1/2*I*a*dilog(-1/2*I*(a*x+I))-1/4*I*a*ln(a*x+I)^2-1/2*I*
a*ln(a*x+I)*ln(1/2*I*(a*x-I))+1/2*I*a*ln(a*x+I)*ln(a^2*x^2+1)-1/2*I*a*dilog
(1/2*I*(a*x-I))
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(ax)^2}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^2/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^2(ax)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**2/x**2,x)
```

```
[Out] Integral(acot(a*x)**2/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^2,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^2/x^2, x)
```

3.20 $\int \frac{\cot^{-1}(ax)^2}{x^3} dx$

Optimal. Leaf size=59

$$-\frac{1}{2}a^2\log\left(a^2x^2+1\right)+a^2\log(x)-\frac{1}{2}a^2\cot^{-1}(ax)^2-\frac{\cot^{-1}(ax)^2}{2x^2}+\frac{a\cot^{-1}(ax)}{x}$$

```
[Out] (a*ArcCot[a*x])/x - (a^2*ArcCot[a*x]^2)/2 - ArcCot[a*x]^2/(2*x^2) + a^2*Log
[x] - (a^2*Log[1 + a^2*x^2])/2
```

Rubi [A] time = 0.087978, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {4853, 4919, 266, 36, 29, 31, 4885}

$$-\frac{1}{2}a^2\log\left(a^2x^2+1\right)+a^2\log(x)-\frac{1}{2}a^2\cot^{-1}(ax)^2-\frac{\cot^{-1}(ax)^2}{2x^2}+\frac{a\cot^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^2/x^3,x]
```

```
[Out] (a*ArcCot[a*x])/x - (a^2*ArcCot[a*x]^2)/2 - ArcCot[a*x]^2/(2*x^2) + a^2*Log
[x] - (a^2*Log[1 + a^2*x^2])/2
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}(ax)^2}{x^3}\,dx &= -\frac{\cot^{-1}(ax)^2}{2x^2} - a\int \frac{\cot^{-1}(ax)}{x^2\left(1+a^2x^2\right)}\,dx \\
&= -\frac{\cot^{-1}(ax)^2}{2x^2} - a\int \frac{\cot^{-1}(ax)}{x^2}\,dx + a^3\int \frac{\cot^{-1}(ax)}{1+a^2x^2}\,dx \\
&= \frac{a\cot^{-1}(ax)}{x} - \frac{1}{2}a^2\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{2x^2} + a^2\int \frac{1}{x\left(1+a^2x^2\right)}\,dx \\
&= \frac{a\cot^{-1}(ax)}{x} - \frac{1}{2}a^2\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{2x^2} + \frac{1}{2}a^2\,\mathrm{Subst}\left(\int \frac{1}{x\left(1+a^2x\right)}\,dx, x, x^2\right) \\
&= \frac{a\cot^{-1}(ax)}{x} - \frac{1}{2}a^2\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{2x^2} + \frac{1}{2}a^2\,\mathrm{Subst}\left(\int \frac{1}{x}\,dx, x, x^2\right) - \frac{1}{2}a^4\,\mathrm{Subst}\left(\int \frac{1}{1+a^2x}\,dx\right. \\
&= \frac{a\cot^{-1}(ax)}{x} - \frac{1}{2}a^2\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{2x^2} + a^2\log(x) - \frac{1}{2}a^2\log\left(1+a^2x^2\right)
\end{aligned}
$$

Mathematica [A] time = 0.0167775, size = 56, normalized size = 0.95

$$-\frac{1}{2}a^2\log\left(a^2x^2+1\right)+\frac{\left(-a^2x^2-1\right)\cot^{-1}(ax)^2}{2x^2}+a^2\log(x)+\frac{a\cot^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]^2/x^3,x]
```

```
[Out] (a*ArcCot[a*x])/x + ((-1 - a^2*x^2)*ArcCot[a*x]^2)/(2*x^2) + a^2*Log[x] - (
a^2*Log[1 + a^2*x^2])/2
```

Maple [A] time = 0.052, size = 68, normalized size = 1.2

$$-\frac{(\operatorname{arccot}(ax))^2}{2x^2}+a^2\operatorname{arccot}(ax)\arctan(ax)+\frac{a\operatorname{arccot}(ax)}{x}-\frac{a^2\ln\left(a^2x^2+1\right)}{2}+a^2\ln(ax)+\frac{a^2(\arctan(ax))^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^2/x^3,x)
```

```
[Out] -1/2*arccot(a*x)^2/x^2+a^2*arccot(a*x)*arctan(a*x)+a*arccot(a*x)/x-1/2*a^2*
ln(a^2*x^2+1)+a^2*ln(a*x)+1/2*a^2*arctan(a*x)^2
```

Maxima [A] time = 1.47291, size = 76, normalized size = 1.29

$$\frac{1}{2}\left(\arctan(ax)^2-\log\left(a^2x^2+1\right)+2\log(x)\right)a^2+\left(a\arctan(ax)+\frac{1}{x}\right)a\operatorname{arccot}(ax)-\frac{\operatorname{arccot}(ax)^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*(arctan(a*x)^2 - log(a^2*x^2 + 1) + 2*log(x))*a^2 + (a*arctan(a*x) + 1/
x)*a*arccot(a*x) - 1/2*arccot(a*x)^2/x^2
```

Fricas [A] time = 2.02672, size = 143, normalized size = 2.42

$$-\frac{a^2x^2\log\left(a^2x^2+1\right)-2\,a^2x^2\log\left(x\right)-2\,ax\,\mathrm{arccot}\left(ax\right)+\left(a^2x^2+1\right)\mathrm{arccot}\left(ax\right)^2}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a^2*x^2*log(a^2*x^2 + 1) - 2*a^2*x^2*log(x) - 2*a*x*arccot(a*x) + (a^
2*x^2 + 1)*arccot(a*x)^2)/x^2
```

Sympy [A] time = 0.695179, size = 53, normalized size = 0.9

$$a^2\log\left(x\right)-\frac{a^2\log\left(a^2x^2+1\right)}{2}-\frac{a^2\,\mathrm{acot}^2\left(ax\right)}{2}+\frac{a\,\mathrm{acot}\left(ax\right)}{x}-\frac{\mathrm{acot}^2\left(ax\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**2/x**3,x)
```

```
[Out] a**2*log(x) - a**2*log(a**2*x**2 + 1)/2 - a**2*acot(a*x)**2/2 + a*acot(a*x)
/x - acot(a*x)**2/(2*x**2)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\mathrm{arccot}\left(ax\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^3,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^2/x^3, x)
```

3.21 $\int \frac{\cot^{-1}(ax)^2}{x^4}\,dx$

Optimal. Leaf size=113

$$\frac{1}{3}ia^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{a^2}{3x}-\frac{1}{3}a^3\tan^{-1}(ax)+\frac{1}{3}ia^3\cot^{-1}(ax)^2+\frac{2}{3}a^3\log\left(2-\frac{2}{1-iax}\right)\cot^{-1}(ax)+\frac{a\cot^{-1}(a}{3x^2}$$

```
[Out] -a^2/(3*x) + (a*ArcCot[a*x])/(3*x^2) + (I/3)*a^3*ArcCot[a*x]^2 - ArcCot[a*x
]^2/(3*x^3) - (a^3*ArcTan[a*x])/3 + (2*a^3*ArcCot[a*x]*Log[2 - 2/(1 - I*a*x
)])/3 + (I/3)*a^3*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rubi [A] time = 0.161392, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {4853, 4919, 325, 203, 4925, 4869, 2447}

$$\frac{1}{3}ia^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{a^2}{3x}-\frac{1}{3}a^3\tan^{-1}(ax)+\frac{1}{3}ia^3\cot^{-1}(ax)^2+\frac{2}{3}a^3\log\left(2-\frac{2}{1-iax}\right)\cot^{-1}(ax)+\frac{a\cot^{-1}(a}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^2/x^4,x]
```

```
[Out] -a^2/(3*x) + (a*ArcCot[a*x])/(3*x^2) + (I/3)*a^3*ArcCot[a*x]^2 - ArcCot[a*x
]^2/(3*x^3) - (a^3*ArcTan[a*x])/3 + (2*a^3*ArcCot[a*x]*Log[2 - 2/(1 - I*a*x
)])/3 + (I/3)*a^3*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^2}{x^4} dx = -\frac{\cot^{-1}(ax)^2}{3x^3} - \frac{1}{3}(2a) \int \frac{\cot^{-1}(ax)}{x^3 \left(1 + a^2x^2\right)} dx$$
$$= -\frac{\cot^{-1}(ax)^2}{3x^3} - \frac{1}{3}(2a) \int \frac{\cot^{-1}(ax)}{x^3} dx + \frac{1}{3}\left(2a^3\right) \int \frac{\cot^{-1}(ax)}{x\left(1 + a^2x^2\right)} dx$$
$$= \frac{a\cot^{-1}(ax)}{3x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{3x^3} + \frac{1}{3}a^2 \int \frac{1}{x^2\left(1 + a^2x^2\right)} dx + \frac{1}{3}\left(2ia^3\right) \int \frac{\cot^{-1}(ax)}{x(i + ax)} dx$$
$$= -\frac{a^2}{3x} + \frac{a\cot^{-1}(ax)}{3x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{3x^3} + \frac{2}{3}a^3\cot^{-1}(ax)\log\left(2 - \frac{2}{1 - iax}\right) - \frac{1}{3}a^4 \int \frac{}{1+}$$
$$= -\frac{a^2}{3x} + \frac{a\cot^{-1}(ax)}{3x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{3x^3} - \frac{1}{3}a^3\tan^{-1}(ax) + \frac{2}{3}a^3\cot^{-1}(ax)\log\left(2 - \frac{2}{1 - i}\right.$$

Mathematica [A] time = 0.23248, size = 96, normalized size = 0.85

$$\frac{-ia^3x^3\text{PolyLog}\left(2, -e^{2i\cot^{-1}(ax)}\right) - a^2x^2 + \left(-1 - ia^3x^3\right)\cot^{-1}(ax)^2 + ax\cot^{-1}(ax)\left(a^2x^2 + 2a^2x^2\log\left(1 + e^{2i\cot^{-1}(ax)}\right) + \right.}{3x^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^2/x^4,x]
```

```
[Out] (-(a^2*x^2) + (-1 - I*a^3*x^3)*ArcCot[a*x]^2 + a*x*ArcCot[a*x]*(1 + a^2*x^2
 + 2*a^2*x^2*Log[1 + E^((2*I)*ArcCot[a*x])]) - I*a^3*x^3*PolyLog[2, -E^((2*
I)*ArcCot[a*x])])/(3*x^3)
```

Maple [B] time = 0.133, size = 290, normalized size = 2.6

$$-\frac{(\text{arccot}\,(ax))^2}{3\,x^3} - \frac{a^3\text{arccot}\,(ax)\ln\left(a^2x^2+1\right)}{3} + \frac{a\text{arccot}\,(ax)}{3\,x^2} + \frac{2\,a^3\ln(ax)\,\text{arccot}\,(ax)}{3} + \frac{i}{12}a^3\left(\ln(ax+i)\right)^2 - \frac{i}{3}a^3\text{dil}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^2/x^4,x)
```

```
[Out] -1/3*arccot(a*x)^2/x^3-1/3*a^3*arccot(a*x)*ln(a^2*x^2+1)+1/3*a*arccot(a*x)/
x^2+2/3*a^3*ln(a*x)*arccot(a*x)+1/12*I*a^3*ln(a*x+I)^2-1/3*I*a^3*dilog(1+I*
```

```
a*x)+1/6*I*a^3*dilog(1/2*I*(a*x-I))+1/6*I*a^3*ln(a*x-I)*ln(a^2*x^2+1)+1/3*I
*a^3*dilog(1-I*a*x)-1/3*I*a^3*ln(a*x)*ln(1+I*a*x)+1/6*I*a^3*ln(a*x+I)*ln(1/
2*I*(a*x-I))-1/6*I*a^3*ln(a*x+I)*ln(a^2*x^2+1)-1/3*a^3*arctan(a*x)-1/3*a^2/
x-1/6*I*a^3*dilog(-1/2*I*(a*x+I))+1/3*I*a^3*ln(a*x)*ln(1-I*a*x)-1/6*I*a^3*l
n(a*x-I)*ln(-1/2*I*(a*x+I))-1/12*I*a^3*ln(a*x-I)^2
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)^2}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^4,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^2/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^2(ax)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**2/x**4,x)
```

```
[Out] Integral(acot(a*x)**2/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^4,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^2/x^4, x)
```

3.22 $\int \frac{\cot^{-1}(ax)^2}{x^5}\,dx$

Optimal. Leaf size=89

$$-\frac{a^2}{12x^2}+\frac{1}{3}a^4\log\left(a^2x^2+1\right)-\frac{2}{3}a^4\log(x)+\frac{1}{4}a^4\cot^{-1}(ax)^2-\frac{a^3\cot^{-1}(ax)}{2x}+\frac{a\cot^{-1}(ax)}{6x^3}-\frac{\cot^{-1}(ax)^2}{4x^4}$$

```
[Out] -a^2/(12*x^2) + (a*ArcCot[a*x])/(6*x^3) - (a^3*ArcCot[a*x])/(2*x) + (a^4*Ar
cCot[a*x]^2)/4 - ArcCot[a*x]^2/(4*x^4) - (2*a^4*Log[x])/3 + (a^4*Log[1 + a^
2*x^2])/3
```

Rubi [A] time = 0.15512, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8, Rules used = {4853, 4919, 266, 44, 36, 29, 31, 4885}

$$-\frac{a^2}{12x^2}+\frac{1}{3}a^4\log\left(a^2x^2+1\right)-\frac{2}{3}a^4\log(x)+\frac{1}{4}a^4\cot^{-1}(ax)^2-\frac{a^3\cot^{-1}(ax)}{2x}+\frac{a\cot^{-1}(ax)}{6x^3}-\frac{\cot^{-1}(ax)^2}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^2/x^5,x]
```

```
[Out] -a^2/(12*x^2) + (a*ArcCot[a*x])/(6*x^3) - (a^3*ArcCot[a*x])/(2*x) + (a^4*Ar
cCot[a*x]^2)/4 - ArcCot[a*x]^2/(4*x^4) - (2*a^4*Log[x])/3 + (a^4*Log[1 + a^
2*x^2])/3
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}(ax)^2}{x^5}\,dx &= -\frac{\cot^{-1}(ax)^2}{4x^4} - \frac{1}{2}a\int \frac{\cot^{-1}(ax)}{x^4\left(1+a^2x^2\right)}\,dx \\
&= -\frac{\cot^{-1}(ax)^2}{4x^4} - \frac{1}{2}a\int \frac{\cot^{-1}(ax)}{x^4}\,dx + \frac{1}{2}a^3\int \frac{\cot^{-1}(ax)}{x^2\left(1+a^2x^2\right)}\,dx \\
&= \frac{a\cot^{-1}(ax)}{6x^3} - \frac{\cot^{-1}(ax)^2}{4x^4} + \frac{1}{6}a^2\int \frac{1}{x^3\left(1+a^2x^2\right)}\,dx + \frac{1}{2}a^3\int \frac{\cot^{-1}(ax)}{x^2}\,dx - \frac{1}{2}a^5\int \frac{\cot^{-1}(ax)}{1+a^2x^2}\,dx \\
&= \frac{a\cot^{-1}(ax)}{6x^3} - \frac{a^3\cot^{-1}(ax)}{2x} + \frac{1}{4}a^4\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{4x^4} + \frac{1}{12}a^2\,\mathrm{Subst}\left(\int \frac{1}{x^2\left(1+a^2x\right)}\,dx, x, x^2\right) \\
&= \frac{a\cot^{-1}(ax)}{6x^3} - \frac{a^3\cot^{-1}(ax)}{2x} + \frac{1}{4}a^4\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{4x^4} + \frac{1}{12}a^2\,\mathrm{Subst}\left(\int \left(\frac{1}{x^2} - \frac{a^2}{x} + \frac{a^4}{1+a^2x}\right) d\right. \\
&= -\frac{a^2}{12x^2} + \frac{a\cot^{-1}(ax)}{6x^3} - \frac{a^3\cot^{-1}(ax)}{2x} + \frac{1}{4}a^4\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{4x^4} - \frac{1}{6}a^4\log(x) + \frac{1}{12}a^4\log\left(1+a^2\right. \\
&= -\frac{a^2}{12x^2} + \frac{a\cot^{-1}(ax)}{6x^3} - \frac{a^3\cot^{-1}(ax)}{2x} + \frac{1}{4}a^4\cot^{-1}(ax)^2 - \frac{\cot^{-1}(ax)^2}{4x^4} - \frac{2}{3}a^4\log(x) + \frac{1}{3}a^4\log\left(1+a^2x\right.
\end{aligned}
$$

Mathematica [A] time = 0.0197266, size = 81, normalized size = 0.91

$$
-\frac{a^2}{12x^2} + \frac{1}{3}a^4\log\left(a^2x^2+1\right) - \frac{a\left(3a^2x^2-1\right)\cot^{-1}(ax)}{6x^3} + \frac{\left(a^4x^4-1\right)\cot^{-1}(ax)^2}{4x^4} - \frac{2}{3}a^4\log(x)
$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]^2/x^5,x]
```

```
[Out] -a^2/(12*x^2) - (a*(-1 + 3*a^2*x^2)*ArcCot[a*x])/(6*x^3) + ((-1 + a^4*x^4)*
ArcCot[a*x]^2)/(4*x^4) - (2*a^4*Log[x])/3 + (a^4*Log[1 + a^2*x^2])/3
```

Maple [A] time = 0.058, size = 91, normalized size = 1.

$$
-\frac{(\mathrm{arccot}\,(ax))^2}{4\,x^4} - \frac{a^4\mathrm{arccot}\,(ax)\arctan(ax)}{2} + \frac{a\mathrm{arccot}\,(ax)}{6\,x^3} - \frac{a^3\mathrm{arccot}\,(ax)}{2\,x} + \frac{a^4\ln\left(a^2x^2+1\right)}{3} - \frac{a^2}{12\,x^2} - \frac{2\,a^4\ln(ax)}{3} -
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^2/x^5,x)
```

```
[Out] -1/4*arccot(a*x)^2/x^4-1/2*a^4*arccot(a*x)*arctan(a*x)+1/6*a*arccot(a*x)/x^
3-1/2*a^3*arccot(a*x)/x+1/3*a^4*ln(a^2*x^2+1)-1/12*a^2/x^2-2/3*a^4*ln(a*x)-
1/4*a^4*arctan(a*x)^2
```

Maxima [A] time = 1.52573, size = 128, normalized size = 1.44

$$-\frac{1}{6}\left(3\,a^3\arctan\left(ax\right)+\frac{3\,a^2x^2-1}{x^3}\right)a\,\mathrm{arccot}\left(ax\right)-\frac{\left(3\,a^2x^2\arctan\left(ax\right)^2-4\,a^2x^2\log\left(a^2x^2+1\right)+8\,a^2x^2\log\left(x\right)+1\right)a^2}{12\,x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^5,x, algorithm="maxima")
```

```
[Out] -1/6*(3*a^3*arctan(a*x) + (3*a^2*x^2 - 1)/x^3)*a*arccot(a*x) - 1/12*(3*a^2*
x^2*arctan(a*x)^2 - 4*a^2*x^2*log(a^2*x^2 + 1) + 8*a^2*x^2*log(x) + 1)*a^2/
x^2 - 1/4*arccot(a*x)^2/x^4
```

Fricas [A] time = 1.87986, size = 181, normalized size = 2.03

$$\frac{4\,a^4x^4\log\left(a^2x^2+1\right)-8\,a^4x^4\log\left(x\right)-a^2x^2+3\left(a^4x^4-1\right)\mathrm{arccot}\left(ax\right)^2-2\left(3\,a^3x^3-ax\right)\mathrm{arccot}\left(ax\right)}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^5,x, algorithm="fricas")
```

```
[Out] 1/12*(4*a^4*x^4*log(a^2*x^2 + 1) - 8*a^4*x^4*log(x) - a^2*x^2 + 3*(a^4*x^4
- 1)*arccot(a*x)^2 - 2*(3*a^3*x^3 - a*x)*arccot(a*x))/x^4
```

Sympy [A] time = 1.19707, size = 80, normalized size = 0.9

$$-\frac{2a^4\log\left(x\right)}{3}+\frac{a^4\log\left(a^2x^2+1\right)}{3}+\frac{a^4\,\mathrm{acot}^2\left(ax\right)}{4}-\frac{a^3\,\mathrm{acot}\left(ax\right)}{2x}-\frac{a^2}{12x^2}+\frac{a\,\mathrm{acot}\left(ax\right)}{6x^3}-\frac{\mathrm{acot}^2\left(ax\right)}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**2/x**5,x)
```

```
[Out] -2*a**4*log(x)/3 + a**4*log(a**2*x**2 + 1)/3 + a**4*acot(a*x)**2/4 - a**3*a
cot(a*x)/(2*x) - a**2/(12*x**2) + a*acot(a*x)/(6*x**3) - acot(a*x)**2/(4*x*
*4)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^2}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^2/x^5,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^2/x^5, x)
```

3.23 $\int x^5 \cot^{-1}(ax)^3 \, dx$

Optimal. Leaf size=194

$$\frac{23i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{30a^6}+\frac{x^3}{60a^3}+\frac{x^4\cot^{-1}(ax)}{20a^2}-\frac{x^3\cot^{-1}(ax)^2}{6a^3}-\frac{4x^2\cot^{-1}(ax)}{15a^4}-\frac{19x}{60a^5}+\frac{19\tan^{-1}(ax)}{60a^6}+\frac{x\cot^{-1}(a}{2a^5}$$

```
[Out] (-19*x)/(60*a^5) + x^3/(60*a^3) - (4*x^2*ArcCot[a*x])/(15*a^4) + (x^4*ArcCo
t[a*x])/(20*a^2) + (((23*I)/30)*ArcCot[a*x]^2)/a^6 + (x*ArcCot[a*x]^2)/(2*a
^5) - (x^3*ArcCot[a*x]^2)/(6*a^3) + (x^5*ArcCot[a*x]^2)/(10*a) + ArcCot[a*x
]^3/(6*a^6) + (x^6*ArcCot[a*x]^3)/6 + (19*ArcTan[a*x])/(60*a^6) - (23*ArcCo
t[a*x]*Log[2/(1 + I*a*x)])/(15*a^6) + (((23*I)/30)*PolyLog[2, 1 - 2/(1 + I*
a*x)])/a^6
```

Rubi [A] time = 0.666636, antiderivative size = 194, normalized size of antiderivative = 1., number of steps used = 33, number of rules used = 11, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.1, Rules used = {4853, 4917, 302, 203, 321, 4921, 4855, 2402, 2315, 4847, 4885}

$$\frac{23i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{30a^6}+\frac{x^3}{60a^3}+\frac{x^4\cot^{-1}(ax)}{20a^2}-\frac{x^3\cot^{-1}(ax)^2}{6a^3}-\frac{4x^2\cot^{-1}(ax)}{15a^4}-\frac{19x}{60a^5}+\frac{19\tan^{-1}(ax)}{60a^6}+\frac{x\cot^{-1}(a}{2a^5}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*ArcCot[a*x]^3,x]
```

```
[Out] (-19*x)/(60*a^5) + x^3/(60*a^3) - (4*x^2*ArcCot[a*x])/(15*a^4) + (x^4*ArcCo
t[a*x])/(20*a^2) + (((23*I)/30)*ArcCot[a*x]^2)/a^6 + (x*ArcCot[a*x]^2)/(2*a
^5) - (x^3*ArcCot[a*x]^2)/(6*a^3) + (x^5*ArcCot[a*x]^2)/(10*a) + ArcCot[a*x
]^3/(6*a^6) + (x^6*ArcCot[a*x]^3)/6 + (19*ArcTan[a*x])/(60*a^6) - (23*ArcCo
t[a*x]*Log[2/(1 + I*a*x)])/(15*a^6) + (((23*I)/30)*PolyLog[2, 1 - 2/(1 + I*
a*x)])/a^6
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int x^5 \cot^{-1}(ax)^3\,dx = \frac{1}{6}x^6\cot^{-1}(ax)^3 + \frac{1}{2}a\int \frac{x^6\cot^{-1}(ax)^2}{1+a^2x^2}\,dx$$

$$= \frac{1}{6}x^6\cot^{-1}(ax)^3 + \frac{\int x^4\cot^{-1}(ax)^2\,dx}{2a} - \frac{\int \frac{x^4\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{2a}$$

$$= \frac{x^5\cot^{-1}(ax)^2}{10a} + \frac{1}{6}x^6\cot^{-1}(ax)^3 + \frac{1}{5}\int \frac{x^5\cot^{-1}(ax)}{1+a^2x^2}\,dx - \frac{\int x^2\cot^{-1}(ax)^2\,dx}{2a^3} + \frac{\int \frac{x^2\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{2a^3}$$

$$= -\frac{x^3\cot^{-1}(ax)^2}{6a^3} + \frac{x^5\cot^{-1}(ax)^2}{10a} + \frac{1}{6}x^6\cot^{-1}(ax)^3 + \frac{\int \cot^{-1}(ax)^2\,dx}{2a^5} - \frac{\int \frac{\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{2a^5} + \frac{\int x^3\cot \ldots}{5 \ldots}$$

$$= \frac{x^4\cot^{-1}(ax)}{20a^2} + \frac{x\cot^{-1}(ax)^2}{2a^5} - \frac{x^3\cot^{-1}(ax)^2}{6a^3} + \frac{x^5\cot^{-1}(ax)^2}{10a} + \frac{\cot^{-1}(ax)^3}{6a^6} + \frac{1}{6}x^6\cot^{-1}(ax)^3 - \ldots$$

$$= -\frac{4x^2\cot^{-1}(ax)}{15a^4} + \frac{x^4\cot^{-1}(ax)}{20a^2} + \frac{23i\cot^{-1}(ax)^2}{30a^6} + \frac{x\cot^{-1}(ax)^2}{2a^5} - \frac{x^3\cot^{-1}(ax)^2}{6a^3} + \frac{x^5\cot^{-1}(ax)^2}{10a} \ldots$$

$$= -\frac{19x}{60a^5} + \frac{x^3}{60a^3} - \frac{4x^2\cot^{-1}(ax)}{15a^4} + \frac{x^4\cot^{-1}(ax)}{20a^2} + \frac{23i\cot^{-1}(ax)^2}{30a^6} + \frac{x\cot^{-1}(ax)^2}{2a^5} - \frac{x^3\cot^{-1}(ax)^2}{6a^3} \ldots$$

$$= -\frac{19x}{60a^5} + \frac{x^3}{60a^3} - \frac{4x^2\cot^{-1}(ax)}{15a^4} + \frac{x^4\cot^{-1}(ax)}{20a^2} + \frac{23i\cot^{-1}(ax)^2}{30a^6} + \frac{x\cot^{-1}(ax)^2}{2a^5} - \frac{x^3\cot^{-1}(ax)^2}{6a^3} \ldots$$

$$= -\frac{19x}{60a^5} + \frac{x^3}{60a^3} - \frac{4x^2\cot^{-1}(ax)}{15a^4} + \frac{x^4\cot^{-1}(ax)}{20a^2} + \frac{23i\cot^{-1}(ax)^2}{30a^6} + \frac{x\cot^{-1}(ax)^2}{2a^5} - \frac{x^3\cot^{-1}(ax)^2}{6a^3} \ldots$$

Mathematica [A] time = 0.600621, size = 125, normalized size = 0.64

$$\frac{46i\text{PolyLog}\left(2,e^{2i\cot^{-1}(ax)}\right)+ax\left(a^2x^2-19\right)+10\left(a^6x^6+1\right)\cot^{-1}(ax)^3+2\left(3a^5x^5-5a^3x^3+15ax+23i\right)\cot^{-1}(ax)^2+\text{c}}{60a^6}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^5*ArcCot[a*x]^3,x]
```

```
[Out] (a*x*(-19 + a^2*x^2) + 2*(23*I + 15*a*x - 5*a^3*x^3 + 3*a^5*x^5)*ArcCot[a*x
]^2 + 10*(1 + a^6*x^6)*ArcCot[a*x]^3 + ArcCot[a*x]*(-19 - 16*a^2*x^2 + 3*a^
4*x^4 - 92*Log[1 - E^((2*I)*ArcCot[a*x])]) + (46*I)*PolyLog[2, E^((2*I)*Arc
Cot[a*x])])/(60*a^6)
```

Maple [A] time = 0.531, size = 243, normalized size = 1.3

$$\frac{x^6\left(\text{arccot}\left(ax\right)\right)^3}{6}+\frac{\left(\text{arccot}\left(ax\right)\right)^3}{6\,a^6}+\frac{x^5\left(\text{arccot}\left(ax\right)\right)^2}{10\,a}-\frac{x^3\left(\text{arccot}\left(ax\right)\right)^2}{6\,a^3}+\frac{x^4\text{arccot}\left(ax\right)}{20\,a^2}-\frac{4\,x^2\text{arccot}\left(ax\right)}{15\,a^4}+\frac{x\left(\text{arcc}\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arccot(a*x)^3,x)
```

```
[Out] 1/6*x^6*arccot(a*x)^3+1/6*arccot(a*x)^3/a^6+1/10*x^5*arccot(a*x)^2/a-1/6*x^
3*arccot(a*x)^2/a^3+1/20*x^4*arccot(a*x)/a^2-4/15*x^2*arccot(a*x)/a^4+1/2*x
*arccot(a*x)^2/a^5+1/60*x^3/a^3-19/60*x/a^5+1/3*I/a^6-19/60/a^6*arccot(a*x)
+23/15*I/a^6*polylog(2,-(a*x+I)/(a^2*x^2+1)^(1/2))-23/15/a^6*arccot(a*x)*ln
(1+(a*x+I)/(a^2*x^2+1)^(1/2))+23/15*I/a^6*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/
2))-23/15/a^6*arccot(a*x)*ln(1-(a*x+I)/(a^2*x^2+1)^(1/2))+23/30*I*arccot(a*
x)^2/a^6
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^5 \operatorname{arccot}(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x^5*arccot(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^5 \operatorname{acot}^3(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*acot(a*x)**3,x)
```

```
[Out] Integral(x**5*acot(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^5 \operatorname{arccot}(ax)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^5*arccot(a*x)^3, x)
```

3.24 $\int x^4 \cot^{-1}(ax)^3 \, dx$

Optimal. Leaf size=205

$$-\frac{3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{10a^5}+\frac{3i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{5a^5}+\frac{x^2}{20a^3}-\frac{\log\left(a^2x^2+1\right)}{2a^5}+\frac{x^3\cot^{-1}(ax)}{10a^2}-\frac{3x^2\cot^{-1}(ax}{10a^3}$$

```
[Out] x^2/(20*a^3) - (9*x*ArcCot[a*x])/(10*a^4) + (x^3*ArcCot[a*x])/(10*a^2) - (9
*ArcCot[a*x]^2)/(20*a^5) - (3*x^2*ArcCot[a*x]^2)/(10*a^3) + (3*x^4*ArcCot[a
*x]^2)/(20*a) + ((I/5)*ArcCot[a*x]^3)/a^5 + (x^5*ArcCot[a*x]^3)/5 - (3*ArcC
ot[a*x]^2*Log[2/(1 + I*a*x)])/(5*a^5) - Log[1 + a^2*x^2]/(2*a^5) + (((3*I)/
5)*ArcCot[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^5 - (3*PolyLog[3, 1 - 2/(1
+ I*a*x)])/(10*a^5)
```

Rubi [A] time = 0.517435, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 22, number of rules used = 11, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.1, Rules used = {4853, 4917, 266, 43, 4847, 260, 4885, 4921, 4855, 4995, 6610}

$$-\frac{3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{10a^5}+\frac{3i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{5a^5}+\frac{x^2}{20a^3}-\frac{\log\left(a^2x^2+1\right)}{2a^5}+\frac{x^3\cot^{-1}(ax)}{10a^2}-\frac{3x^2\cot^{-1}(ax}{10a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*ArcCot[a*x]^3,x]
```


```
[Out] x^2/(20*a^3) - (9*x*ArcCot[a*x])/(10*a^4) + (x^3*ArcCot[a*x])/(10*a^2) - (9
*ArcCot[a*x]^2)/(20*a^5) - (3*x^2*ArcCot[a*x]^2)/(10*a^3) + (3*x^4*ArcCot[a
*x]^2)/(20*a) + ((I/5)*ArcCot[a*x]^3)/a^5 + (x^5*ArcCot[a*x]^3)/5 - (3*ArcC
ot[a*x]^2*Log[2/(1 + I*a*x)])/(5*a^5) - Log[1 + a^2*x^2]/(2*a^5) + (((3*I)/
5)*ArcCot[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^5 - (3*PolyLog[3, 1 - 2/(1
+ I*a*x)])/(10*a^5)
```


Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int x^4\cot^{-1}(ax)^3\,dx = \frac{1}{5}x^5\cot^{-1}(ax)^3 + \frac{1}{5}(3a)\int\frac{x^5\cot^{-1}(ax)^2}{1+a^2x^2}\,dx$$

$$= \frac{1}{5}x^5\cot^{-1}(ax)^3 + \frac{3\int x^3\cot^{-1}(ax)^2\,dx}{5a} - \frac{3\int\frac{x^3\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{5a}$$

$$= \frac{3x^4\cot^{-1}(ax)^2}{20a} + \frac{1}{5}x^5\cot^{-1}(ax)^3 + \frac{3}{10}\int\frac{x^4\cot^{-1}(ax)}{1+a^2x^2}\,dx - \frac{3\int x\cot^{-1}(ax)^2\,dx}{5a^3} + \frac{3\int\frac{x\cot^{-1}(ax)^2}{1+a^2x^2}\,d}{5a^3}$$

$$= -\frac{3x^2\cot^{-1}(ax)^2}{10a^3} + \frac{3x^4\cot^{-1}(ax)^2}{20a} + \frac{i\cot^{-1}(ax)^3}{5a^5} + \frac{1}{5}x^5\cot^{-1}(ax)^3 - \frac{3\int\frac{\cot^{-1}(ax)^2}{i-ax}\,dx}{5a^4} + \frac{3\int x^2\,\mathrm{co}}{10}$$

$$= \frac{x^3\cot^{-1}(ax)}{10a^2} - \frac{3x^2\cot^{-1}(ax)^2}{10a^3} + \frac{3x^4\cot^{-1}(ax)^2}{20a} + \frac{i\cot^{-1}(ax)^3}{5a^5} + \frac{1}{5}x^5\cot^{-1}(ax)^3 - \frac{3\cot^{-1}(ax)^2\,\mathrm{l}}{5a^5}$$

$$= -\frac{9x\cot^{-1}(ax)}{10a^4} + \frac{x^3\cot^{-1}(ax)}{10a^2} - \frac{9\cot^{-1}(ax)^2}{20a^5} - \frac{3x^2\cot^{-1}(ax)^2}{10a^3} + \frac{3x^4\cot^{-1}(ax)^2}{20a} + \frac{i\cot^{-1}(ax)^3}{5a^5} +$$

$$= -\frac{9x\cot^{-1}(ax)}{10a^4} + \frac{x^3\cot^{-1}(ax)}{10a^2} - \frac{9\cot^{-1}(ax)^2}{20a^5} - \frac{3x^2\cot^{-1}(ax)^2}{10a^3} + \frac{3x^4\cot^{-1}(ax)^2}{20a} + \frac{i\cot^{-1}(ax)^3}{5a^5} +$$

$$= \frac{x^2}{20a^3} - \frac{9x\cot^{-1}(ax)}{10a^4} + \frac{x^3\cot^{-1}(ax)}{10a^2} - \frac{9\cot^{-1}(ax)^2}{20a^5} - \frac{3x^2\cot^{-1}(ax)^2}{10a^3} + \frac{3x^4\cot^{-1}(ax)^2}{20a} + \frac{i\cot^{-1}(}{5a^5}$$

Mathematica [A] time = 0.585929, size = 184, normalized size = 0.9

$$-24i\cot^{-1}(ax)\text{PolyLog}\left(2,e^{-2i\cot^{-1}(ax)}\right)-12\text{PolyLog}\left(3,e^{-2i\cot^{-1}(ax)}\right)+2a^2x^2+40\log\left(\frac{1}{ax\sqrt{\frac{1}{a^2x^2}+1}}\right)+8a^5x^5\cot^{-1}(ax)$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^4*ArcCot[a*x]^3,x]
```

```
[Out] (2 + I*Pi^3 + 2*a^2*x^2 - 36*a*x*ArcCot[a*x] + 4*a^3*x^3*ArcCot[a*x] - 18*A
rcCot[a*x]^2 - 12*a^2*x^2*ArcCot[a*x]^2 + 6*a^4*x^4*ArcCot[a*x]^2 - (8*I)*A
rcCot[a*x]^3 + 8*a^5*x^5*ArcCot[a*x]^3 - 24*ArcCot[a*x]^2*Log[1 - E^((-2*I)
*ArcCot[a*x])] + 40*Log[1/(a*Sqrt[1 + 1/(a^2*x^2)]*x)] - (24*I)*ArcCot[a*x]
*PolyLog[2, E^((-2*I)*ArcCot[a*x])] - 12*PolyLog[3, E^((-2*I)*ArcCot[a*x])]
)/(40*a^5)
```

Maple [C] time = 3.753, size = 2731, normalized size = 13.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arccot(a*x)^3,x)
```

```
[Out] -9/10*x*arccot(a*x)/a^4+1/10*x^3*arccot(a*x)/a^2-3/10*x^2*arccot(a*x)^2/a^3
+3/20*x^4*arccot(a*x)^2/a+1/20/a^5-6/5/a^5*polylog(3,(a*x+I)/(a^2*x^2+1)^(1
/2))-6/5/a^5*polylog(3,-(a*x+I)/(a^2*x^2+1)^(1/2))+1/a^5*ln(1+(a*x+I)/(a^2*
x^2+1)^(1/2))+1/a^5*ln((a*x+I)/(a^2*x^2+1)^(1/2)-1)-3/10*I/a^5*arccot(a*x)^
2*Pi+6/5*I/a^5*arccot(a*x)*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))+6/5*I/a^5*a
rccot(a*x)*polylog(2,-(a*x+I)/(a^2*x^2+1)^(1/2))+1/5*I*arccot(a*x)^3/a^5+1/
20*x^2/a^3-9/20*arccot(a*x)^2/a^5+1/5*x^5*arccot(a*x)^3+9/160/a^4*arccot(a*
x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)^3*x+9/
160/a^4*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^3*x+21/160*I/a
^5*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+
1)-I)^3-3/160*I/a^5*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^3-
3/20*I/a^5*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^
2+1)-1)^2)^3+9/160/a^4*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I
*(a*x+I)^2/(a^2*x^2+1)-I)*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)^2*x-9/80/a^4*arcc
ot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I*((a*x+I)^2/(a^2*x
^2+1)-1))*x+9/160/a^4*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)*
```

```
csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))^2*x+3/80/a^2*arccot(a*x)^2*Pi*csgn(I*((a*
x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))*x^3-3/160/a^2*
arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)*csgn(I*((a*x+I)^2/(a^2
*x^2+1)-1))^2*x^3-3/80/a^2*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2
+2*I*(a*x+I)^2/(a^2*x^2+1)-I)^2*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)*x^3-3/160/a
^2*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+
1)-I)*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)^2*x^3+9/160*I/a^3*arccot(a*x)^2*Pi*cs
gn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)^3*x^2+9/160*I/a^
3*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^3*x^2+21/80*I/a^5*ar
ccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)
^2*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)+21/160*I/a^5*arccot(a*x)^2*Pi*csgn(-I*(a
*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)*csgn(I*(a*x+I)^2/(a^2*x^
2+1)-I)^2+3/80*I/a^5*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^2
*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))-3/160*I/a^5*arccot(a*x)^2*Pi*csgn(I*((a*
x+I)^2/(a^2*x^2+1)-1)^2)*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))^2-3/20*I/a^5*arc
cot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*c
sgn(I*(a*x+I)^2/(a^2*x^2+1))-3/20*I/a^5*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(
a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)^
2)-3/10*I/a^5*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))^2*csgn(I*(a*x+
I)/(a^2*x^2+1)^(1/2))+3/20*I/a^5*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2
+1))*csgn(I*(a*x+I)/(a^2*x^2+1)^(1/2))^2+9/80/a^4*arccot(a*x)^2*Pi*csgn(-I*
(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)^2*csgn(I*(a*x+I)^2/(a^
2*x^2+1)-I)*x+3/20*I/a^5*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))^3-3
/160/a^2*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^3*x^3-9/80*I/
a^3*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I*((a*x+I)^
2/(a^2*x^2+1)-1))*x^2+9/160*I/a^3*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x
^2+1)-1)^2)*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))^2*x^2+3/20*I/a^5*arccot(a*x)^
2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)*csgn(I*(a*x+
I)^2/(a^2*x^2+1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)^2)+9/80*I/a^3*arccot(a*x
)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)^2*csgn(
I*(a*x+I)^2/(a^2*x^2+1)-I)*x^2+9/160*I/a^3*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)
^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)*csgn(I*(a*x+I)^2/(a^2*x^2+1)-
I)^2*x^2+3/10*I/a^5*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^
2/(a^2*x^2+1)-1)^2)^2+3/5/a^5*arccot(a*x)^2*ln((a*x+I)^2/(a^2*x^2+1)-1)+3/1
0/a^5*arccot(a*x)^2*ln(a^2*x^2+1)-3/5/a^5*arccot(a*x)^2*ln(1-(a*x+I)/(a^2*x
^2+1)^(1/2))-3/5/a^5*arccot(a*x)^2*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2))-3/5/a^5*
arccot(a*x)^2*ln((a*x+I)/(a^2*x^2+1)^(1/2))-3/5/a^5*arccot(a*x)^2*ln(2)-I/a
^5*arccot(a*x)-3/160/a^2*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2
*I*(a*x+I)^2/(a^2*x^2+1)-I)^3*x^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{40}\,x^5\arctan\left(1,ax\right)^3-\frac{3}{160}\,x^5\arctan\left(1,ax\right)\log\left(a^2x^2+1\right)^2+\int\frac{140\,a^2x^6\arctan\left(1,ax\right)^3+12\,a^2x^6\arctan\left(1,ax\right)\log\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/40*x^5*arctan2(1, a*x)^3 - 3/160*x^5*arctan2(1, a*x)*log(a^2*x^2 + 1)^2 +
 integrate(1/160*(140*a^2*x^6*arctan2(1, a*x)^3 + 12*a^2*x^6*arctan2(1, a*x
)*log(a^2*x^2 + 1) + 12*a*x^5*arctan2(1, a*x)^2 + 140*x^4*arctan2(1, a*x)^3
 + 3*(5*a^2*x^6*arctan2(1, a*x) - a*x^5 + 5*x^4*arctan2(1, a*x))*log(a^2*x^
2 + 1)^2)/(a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(x^4\operatorname{arccot}\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x^4*arccot(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^4\operatorname{acot}^3\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*acot(a*x)**3,x)
```

```
[Out] Integral(x**4*acot(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^4 \operatorname{arccot}(ax)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^4*arccot(a*x)^3, x)
```

3.25 $\int x^3 \cot^{-1}(ax)^3 \, dx$

Optimal. Leaf size=148

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^4}+\frac{x^2\cot^{-1}(ax)}{4a^2}+\frac{x}{4a^3}-\frac{\tan^{-1}(ax)}{4a^4}-\frac{3x\cot^{-1}(ax)^2}{4a^3}-\frac{\cot^{-1}(ax)^3}{4a^4}-\frac{i\cot^{-1}(ax)^2}{a^4}+\frac{2\log\left(\frac{2}{1+i\cdots}\right)\cdots}{\cdots}$$

```
[Out] x/(4*a^3) + (x^2*ArcCot[a*x])/(4*a^2) - (I*ArcCot[a*x]^2)/a^4 - (3*x*ArcCot
[a*x]^2)/(4*a^3) + (x^3*ArcCot[a*x]^2)/(4*a) - ArcCot[a*x]^3/(4*a^4) + (x^4
*ArcCot[a*x]^3)/4 - ArcTan[a*x]/(4*a^4) + (2*ArcCot[a*x]*Log[2/(1 + I*a*x)]
)/a^4 - (I*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^4
```

Rubi [A] time = 0.385544, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 10, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1., Rules used = {4853, 4917, 321, 203, 4921, 4855, 2402, 2315, 4847, 4885}

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^4}+\frac{x^2\cot^{-1}(ax)}{4a^2}+\frac{x}{4a^3}-\frac{\tan^{-1}(ax)}{4a^4}-\frac{3x\cot^{-1}(ax)^2}{4a^3}-\frac{\cot^{-1}(ax)^3}{4a^4}-\frac{i\cot^{-1}(ax)^2}{a^4}+\frac{2\log\left(\frac{2}{1+i\cdots}\right)\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcCot[a*x]^3,x]
```

```
[Out] x/(4*a^3) + (x^2*ArcCot[a*x])/(4*a^2) - (I*ArcCot[a*x]^2)/a^4 - (3*x*ArcCot
[a*x]^2)/(4*a^3) + (x^3*ArcCot[a*x]^2)/(4*a) - ArcCot[a*x]^3/(4*a^4) + (x^4
*ArcCot[a*x]^3)/4 - ArcTan[a*x]/(4*a^4) + (2*ArcCot[a*x]*Log[2/(1 + I*a*x)]
)/a^4 - (I*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^4
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
```

```
e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int x^3 \cot^{-1}(ax)^3\,dx = \frac{1}{4}x^4\cot^{-1}(ax)^3 + \frac{1}{4}(3a)\int \frac{x^4\cot^{-1}(ax)^2}{1+a^2x^2}\,dx$$

$$= \frac{1}{4}x^4\cot^{-1}(ax)^3 + \frac{3\int x^2\cot^{-1}(ax)^2\,dx}{4a} - \frac{3\int \frac{x^2\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{4a}$$

$$= \frac{x^3\cot^{-1}(ax)^2}{4a} + \frac{1}{4}x^4\cot^{-1}(ax)^3 + \frac{1}{2}\int \frac{x^3\cot^{-1}(ax)}{1+a^2x^2}\,dx - \frac{3\int \cot^{-1}(ax)^2\,dx}{4a^3} + \frac{3\int \frac{\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{4a^3}$$

$$= -\frac{3x\cot^{-1}(ax)^2}{4a^3} + \frac{x^3\cot^{-1}(ax)^2}{4a} - \frac{\cot^{-1}(ax)^3}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^3 + \frac{\int x\cot^{-1}(ax)\,dx}{2a^2} - \frac{\int \frac{x\cot^{-1}(ax}{1+a^2x^2}}{2a^2}$$

$$= \frac{x^2\cot^{-1}(ax)}{4a^2} - \frac{i\cot^{-1}(ax)^2}{a^4} - \frac{3x\cot^{-1}(ax)^2}{4a^3} + \frac{x^3\cot^{-1}(ax)^2}{4a} - \frac{\cot^{-1}(ax)^3}{4a^4} + \frac{1}{4}x^4\cot^{-1}(ax)^3 +$$

$$= \frac{x}{4a^3} + \frac{x^2\cot^{-1}(ax)}{4a^2} - \frac{i\cot^{-1}(ax)^2}{a^4} - \frac{3x\cot^{-1}(ax)^2}{4a^3} + \frac{x^3\cot^{-1}(ax)^2}{4a} - \frac{\cot^{-1}(ax)^3}{4a^4} + \frac{1}{4}x^4\cot^{-1}(a$$

$$= \frac{x}{4a^3} + \frac{x^2\cot^{-1}(ax)}{4a^2} - \frac{i\cot^{-1}(ax)^2}{a^4} - \frac{3x\cot^{-1}(ax)^2}{4a^3} + \frac{x^3\cot^{-1}(ax)^2}{4a} - \frac{\cot^{-1}(ax)^3}{4a^4} + \frac{1}{4}x^4\cot^{-1}(a$$

$$= \frac{x}{4a^3} + \frac{x^2\cot^{-1}(ax)}{4a^2} - \frac{i\cot^{-1}(ax)^2}{a^4} - \frac{3x\cot^{-1}(ax)^2}{4a^3} + \frac{x^3\cot^{-1}(ax)^2}{4a} - \frac{\cot^{-1}(ax)^3}{4a^4} + \frac{1}{4}x^4\cot^{-1}(a$$

Mathematica [A] time = 0.332578, size = 96, normalized size = 0.65

$$\frac{-4i\text{PolyLog}\left(2, e^{2i\cot^{-1}(ax)}\right) + \left(a^4x^4-1\right)\cot^{-1}(ax)^3 + \left(a^3x^3-3ax-4i\right)\cot^{-1}(ax)^2 + \cot^{-1}(ax)\left(a^2x^2+8\log\left(1-e^{2i\cot}\right.\right.}{4a^4}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*ArcCot[a*x]^3,x]
```

```
[Out] (a*x + (-4*I - 3*a*x + a^3*x^3)*ArcCot[a*x]^2 + (-1 + a^4*x^4)*ArcCot[a*x]^
3 + ArcCot[a*x]*(1 + a^2*x^2 + 8*Log[1 - E^((2*I)*ArcCot[a*x])]) - (4*I)*Po
lyLog[2, E^((2*I)*ArcCot[a*x])])/(4*a^4)
```

Maple [A] time = 0.451, size = 209, normalized size = 1.4

$$\frac{x^4 (\operatorname{arccot}(ax))^3}{4} - \frac{(\operatorname{arccot}(ax))^3}{4a^4} + \frac{x^3 (\operatorname{arccot}(ax))^2}{4a} - \frac{3x (\operatorname{arccot}(ax))^2}{4a^3} + \frac{x^2 \operatorname{arccot}(ax)}{4a^2} - \frac{i (\operatorname{arccot}(ax))^2}{a^4} + \frac{\operatorname{arccot}}{4a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(a*x)^3,x)
```

```
[Out] 1/4*x^4*arccot(a*x)^3-1/4*arccot(a*x)^3/a^4+1/4*x^3*arccot(a*x)^2/a-3/4*x*a
rccot(a*x)^2/a^3+1/4*x^2*arccot(a*x)/a^2-I*arccot(a*x)^2/a^4+1/4/a^4*arccot
(a*x)+1/4*x/a^3-1/4*I/a^4+2/a^4*arccot(a*x)*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2))
-2*I/a^4*polylog(2,-(a*x+I)/(a^2*x^2+1)^(1/2))+2/a^4*arccot(a*x)*ln(1-(a*x+
I)/(a^2*x^2+1)^(1/2))-2*I/a^4*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^3 \operatorname{arccot}(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x^3*arccot(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3 \operatorname{acot}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(a*x)**3,x)
```

```
[Out] Integral(x**3*acot(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^3 \operatorname{arccot}(ax)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^3*arccot(a*x)^3, x)
```

3.26 $\int x^2 \cot^{-1}(ax)^3 \, dx$

Optimal. Leaf size=157

$$\frac{\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^3}-\frac{i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^3}+\frac{\log\left(a^2x^2+1\right)}{2a^3}-\frac{i\cot^{-1}(ax)^3}{3a^3}+\frac{\cot^{-1}(ax)^2}{2a^3}+\frac{x\cot^{-1}(ax)}{a^2}$$

```
[Out] (x*ArcCot[a*x])/a^2 + ArcCot[a*x]^2/(2*a^3) + (x^2*ArcCot[a*x]^2)/(2*a) - (
(I/3)*ArcCot[a*x]^3)/a^3 + (x^3*ArcCot[a*x]^3)/3 + (ArcCot[a*x]^2*Log[2/(1
+ I*a*x)])/a^3 + Log[1 + a^2*x^2]/(2*a^3) - (I*ArcCot[a*x]*PolyLog[2, 1 - 2
/(1 + I*a*x)])/a^3 + PolyLog[3, 1 - 2/(1 + I*a*x)]/(2*a^3)
```

Rubi [A] time = 0.301527, antiderivative size = 157, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.9, Rules used = {4853, 4917, 4847, 260, 4885, 4921, 4855, 4995, 6610}

$$\frac{\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^3}-\frac{i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^3}+\frac{\log\left(a^2x^2+1\right)}{2a^3}-\frac{i\cot^{-1}(ax)^3}{3a^3}+\frac{\cot^{-1}(ax)^2}{2a^3}+\frac{x\cot^{-1}(ax)}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[a*x]^3,x]
```


```
[Out] (x*ArcCot[a*x])/a^2 + ArcCot[a*x]^2/(2*a^3) + (x^2*ArcCot[a*x]^2)/(2*a) - (
(I/3)*ArcCot[a*x]^3)/a^3 + (x^3*ArcCot[a*x]^3)/3 + (ArcCot[a*x]^2*Log[2/(1
+ I*a*x)])/a^3 + Log[1 + a^2*x^2]/(2*a^3) - (I*ArcCot[a*x]*PolyLog[2, 1 - 2
/(1 + I*a*x)])/a^3 + PolyLog[3, 1 - 2/(1 + I*a*x)]/(2*a^3)
```


Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
```

```
e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int x^2 \cot^{-1}(ax)^3\,dx = \frac{1}{3}x^3\cot^{-1}(ax)^3 + a\int \frac{x^3\cot^{-1}(ax)^2}{1+a^2x^2}\,dx$$
$$= \frac{1}{3}x^3\cot^{-1}(ax)^3 + \frac{\int x\cot^{-1}(ax)^2\,dx}{a} - \frac{\int \frac{x\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{a}$$
$$= \frac{x^2\cot^{-1}(ax)^2}{2a} - \frac{i\cot^{-1}(ax)^3}{3a^3} + \frac{1}{3}x^3\cot^{-1}(ax)^3 + \frac{\int \frac{\cot^{-1}(ax)^2}{i-ax}\,dx}{a^2} + \int \frac{x^2\cot^{-1}(ax)}{1+a^2x^2}\,dx$$
$$= \frac{x^2\cot^{-1}(ax)^2}{2a} - \frac{i\cot^{-1}(ax)^3}{3a^3} + \frac{1}{3}x^3\cot^{-1}(ax)^3 + \frac{\cot^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^3} + \frac{\int \cot^{-1}(ax)\,dx}{a^2} - \frac{\int \frac{\cot}{1+}}{}$$
$$= \frac{x\cot^{-1}(ax)}{a^2} + \frac{\cot^{-1}(ax)^2}{2a^3} + \frac{x^2\cot^{-1}(ax)^2}{2a} - \frac{i\cot^{-1}(ax)^3}{3a^3} + \frac{1}{3}x^3\cot^{-1}(ax)^3 + \frac{\cot^{-1}(ax)^2\log\left(\frac{2}{1+ia}\right.}{a^3}$$
$$= \frac{x\cot^{-1}(ax)}{a^2} + \frac{\cot^{-1}(ax)^2}{2a^3} + \frac{x^2\cot^{-1}(ax)^2}{2a} - \frac{i\cot^{-1}(ax)^3}{3a^3} + \frac{1}{3}x^3\cot^{-1}(ax)^3 + \frac{\cot^{-1}(ax)^2\log\left(\frac{2}{1+ia}\right.}{a^3}$$

Mathematica [A] time = 0.323755, size = 149, normalized size = 0.95

$$\frac{24i\cot^{-1}(ax)\text{PolyLog}\left(2,e^{-2i\cot^{-1}(ax)}\right) + 12\text{PolyLog}\left(3,e^{-2i\cot^{-1}(ax)}\right) - 24\log\left(\frac{1}{ax\sqrt{\frac{1}{a^2x^2}+1}}\right) + 8a^3x^3\cot^{-1}(ax)^3 + 12a^2x^2}{24a^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*ArcCot[a*x]^3,x]
```

```
[Out] ((-I)*Pi^3 + 24*a*x*ArcCot[a*x] + 12*ArcCot[a*x]^2 + 12*a^2*x^2*ArcCot[a*x]
^2 + (8*I)*ArcCot[a*x]^3 + 8*a^3*x^3*ArcCot[a*x]^3 + 24*ArcCot[a*x]^2*Log[1
 - E^((-2*I)*ArcCot[a*x])] - 24*Log[1/(a*Sqrt[1 + 1/(a^2*x^2)]*x)] + (24*I)
*ArcCot[a*x]*PolyLog[2, E^((-2*I)*ArcCot[a*x])] + 12*PolyLog[3, E^((-2*I)*A
rcCot[a*x])])/(24*a^3)
```

Maple [C] time = 1.355, size = 1815, normalized size = 11.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(a*x)^3,x)
```

```
[Out] -1/8/a^2*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^
2*x^2+1)-I)^3*x+1/2*x^2*arccot(a*x)^2/a-1/3*I*arccot(a*x)^3/a^3+1/4*I/a^3*a
rccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^3
-1/8*I/a^3*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(
a^2*x^2+1)-I)*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)^2-1/4*I/a^3*arccot(a*x)^2*Pi*
csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))+1/8
*I/a^3*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)*csgn(I*((a*x+I)
^2/(a^2*x^2+1)-1))^2+1/2*I/a^3*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1
))^2*csgn(I*(a*x+I)/(a^2*x^2+1)^(1/2))+1/4*I/a^3*arccot(a*x)^2*Pi*csgn(I*(a
*x+I)^2/(a^2*x^2+1))*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)
^2)^2-1/4*I/a^3*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))*csgn(I*(a*x+
I)/(a^2*x^2+1)^(1/2))^2+1/4*I/a^3*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^
2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)^2)-1/4
/a^2*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^
2+1)-I)^2*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)*x-1/8/a^2*arccot(a*x)^2*Pi*csgn(-
I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I)*csgn(I*(a*x+I)^2/(a^
2*x^2+1)-I)^2*x+1/4/a^2*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2
)^2*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))*x-1/8/a^2*arccot(a*x)^2*Pi*csgn(I*((a
*x+I)^2/(a^2*x^2+1)-1)^2)*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1))^2*x-1/4*I/a^3*a
rccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a^2*x^2+1)-I
)^2*csgn(I*(a*x+I)^2/(a^2*x^2+1)-I)+x*arccot(a*x)/a^2-1/2*I/a^3*arccot(a*x)
^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^2-2*I/a^3*a
rccot(a*x)*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))-2*I/a^3*arccot(a*x)*polylog
(2,-(a*x+I)/(a^2*x^2+1)^(1/2))+1/2*I/a^3*arccot(a*x)^2*Pi-1/4*I/a^3*arccot(
a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+
I)^2/(a^2*x^2+1)-1)^2)*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)^2)-1/2/a^3*arccot(a
*x)^2*ln(a^2*x^2+1)+1/a^3*arccot(a*x)^2*ln((a*x+I)/(a^2*x^2+1)^(1/2))-1/a^3
*arccot(a*x)^2*ln((a*x+I)^2/(a^2*x^2+1)-1)+1/a^3*arccot(a*x)^2*ln(1-(a*x+I)
/(a^2*x^2+1)^(1/2))+1/a^3*arccot(a*x)^2*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2))+I/a
^3*arccot(a*x)+1/a^3*arccot(a*x)^2*ln(2)+1/2*arccot(a*x)^2/a^3+1/3*x^3*arcc
ot(a*x)^3-1/8/a^2*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^3*x-
1/8*I/a^3*arccot(a*x)^2*Pi*csgn(-I*(a*x+I)^4/(a^2*x^2+1)^2+2*I*(a*x+I)^2/(a
^2*x^2+1)-I)^3+1/8*I/a^3*arccot(a*x)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^
2)^3-1/4*I/a^3*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))^3+2/a^3*polyl
og(3,(a*x+I)/(a^2*x^2+1)^(1/2))+2/a^3*polylog(3,-(a*x+I)/(a^2*x^2+1)^(1/2))
-1/a^3*ln((a*x+I)/(a^2*x^2+1)^(1/2)-1)-1/a^3*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2)
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{24}x^3\arctan(1,ax)^3-\frac{1}{32}x^3\arctan(1,ax)\log\left(a^2x^2+1\right)^2+\int\frac{28\,a^2x^4\arctan(1,ax)^3+4\,a^2x^4\arctan(1,ax)\log\left(a^2x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/24*x^3*arctan2(1, a*x)^3 - 1/32*x^3*arctan2(1, a*x)*log(a^2*x^2 + 1)^2 +
integrate(1/32*(28*a^2*x^4*arctan2(1, a*x)^3 + 4*a^2*x^4*arctan2(1, a*x)*lo
g(a^2*x^2 + 1) + 4*a*x^3*arctan2(1, a*x)^2 + 28*x^2*arctan2(1, a*x)^3 + (3*
a^2*x^4*arctan2(1, a*x) - a*x^3 + 3*x^2*arctan2(1, a*x))*log(a^2*x^2 + 1)^2
)/(a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(x^2\,\mathrm{arccot}(ax)^3\,,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x^2*arccot(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\,\mathrm{acot}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(a*x)**3,x)
```

```
[Out] Integral(x**2*acot(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(ax)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(a*x)^3, x)
```

3.27 $\int x \cot^{-1}(ax)^3 \, dx$

Optimal. Leaf size=103

$$\frac{3i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^2}+\frac{\cot^{-1}(ax)^3}{2a^2}+\frac{3i\cot^{-1}(ax)^2}{2a^2}-\frac{3\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{a^2}+\frac{1}{2}x^2\cot^{-1}(ax)^3+\frac{3x\cot^{-1}(ax)^2}{2a}$$

```
[Out] (((3*I)/2)*ArcCot[a*x]^2)/a^2 + (3*x*ArcCot[a*x]^2)/(2*a) + ArcCot[a*x]^3/(
2*a^2) + (x^2*ArcCot[a*x]^3)/2 - (3*ArcCot[a*x]*Log[2/(1 + I*a*x)])/a^2 + (
((3*I)/2)*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^2
```

Rubi [A] time = 0.170855, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1., Rules used = {4853, 4917, 4847, 4921, 4855, 2402, 2315, 4885}

$$\frac{3i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^2}+\frac{\cot^{-1}(ax)^3}{2a^2}+\frac{3i\cot^{-1}(ax)^2}{2a^2}-\frac{3\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax)}{a^2}+\frac{1}{2}x^2\cot^{-1}(ax)^3+\frac{3x\cot^{-1}(ax)^2}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[a*x]^3,x]
```


```
[Out] (((3*I)/2)*ArcCot[a*x]^2)/a^2 + (3*x*ArcCot[a*x]^2)/(2*a) + ArcCot[a*x]^3/(
2*a^2) + (x^2*ArcCot[a*x]^3)/2 - (3*ArcCot[a*x]*Log[2/(1 + I*a*x)])/a^2 + (
((3*I)/2)*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^2
```


Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int x\cot^{-1}(ax)^3\,dx = \frac{1}{2}x^2\cot^{-1}(ax)^3 + \frac{1}{2}(3a)\int\frac{x^2\cot^{-1}(ax)^2}{1+a^2x^2}\,dx$$
$$= \frac{1}{2}x^2\cot^{-1}(ax)^3 + \frac{3\int\cot^{-1}(ax)^2\,dx}{2a} - \frac{3\int\frac{\cot^{-1}(ax)^2}{1+a^2x^2}\,dx}{2a}$$
$$= \frac{3x\cot^{-1}(ax)^2}{2a} + \frac{\cot^{-1}(ax)^3}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^3 + 3\int\frac{x\cot^{-1}(ax)}{1+a^2x^2}\,dx$$
$$= \frac{3i\cot^{-1}(ax)^2}{2a^2} + \frac{3x\cot^{-1}(ax)^2}{2a} + \frac{\cot^{-1}(ax)^3}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^3 - \frac{3\int\frac{\cot^{-1}(ax)}{i-ax}\,dx}{a}$$
$$= \frac{3i\cot^{-1}(ax)^2}{2a^2} + \frac{3x\cot^{-1}(ax)^2}{2a} + \frac{\cot^{-1}(ax)^3}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^3 - \frac{3\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^2} - \frac{3\int\frac{\log(\frac{}{1}}{1+a}}{a}$$
$$= \frac{3i\cot^{-1}(ax)^2}{2a^2} + \frac{3x\cot^{-1}(ax)^2}{2a} + \frac{\cot^{-1}(ax)^3}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^3 - \frac{3\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^2} + \frac{(3i)\,\mathrm{Sub}}{}$$
$$= \frac{3i\cot^{-1}(ax)^2}{2a^2} + \frac{3x\cot^{-1}(ax)^2}{2a} + \frac{\cot^{-1}(ax)^3}{2a^2} + \frac{1}{2}x^2\cot^{-1}(ax)^3 - \frac{3\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^2} + \frac{3i\mathrm{Li}_2\left(1\right.}{2a}$$

Mathematica [A] time = 0.0857338, size = 76, normalized size = 0.74

$$\frac{3i\mathrm{PolyLog}\left(2,e^{2i\cot^{-1}(ax)}\right) + \cot^{-1}(ax)\left(\left(a^2x^2+1\right)\cot^{-1}(ax)^2 + 3(ax+i)\cot^{-1}(ax) - 6\log\left(1-e^{2i\cot^{-1}(ax)}\right)\right)}{2a^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*ArcCot[a*x]^3,x]
```

```
[Out] (ArcCot[a*x]*(3*(I + a*x)*ArcCot[a*x] + (1 + a^2*x^2)*ArcCot[a*x]^2 - 6*Log
[1 - E^((2*I)*ArcCot[a*x])]) + (3*I)*PolyLog[2, E^((2*I)*ArcCot[a*x])])/(2*
a^2)
```

Maple [A] time = 0.316, size = 162, normalized size = 1.6

$$\frac{x^2(\mathrm{arccot}(ax))^3}{2} + \frac{(\mathrm{arccot}(ax))^3}{2a^2} + \frac{3x(\mathrm{arccot}(ax))^2}{2a} + \frac{\frac{3i}{2}(\mathrm{arccot}(ax))^2}{a^2} - 3\frac{\mathrm{arccot}(ax)}{a^2}\ln\left(1-\frac{ax+i}{\sqrt{a^2x^2+1}}\right) - 3\,\mathrm{arcc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(a*x)^3,x)
```

```
[Out] 1/2*x^2*arccot(a*x)^3+1/2*arccot(a*x)^3/a^2+3/2*x*arccot(a*x)^2/a+3/2*I*arc
cot(a*x)^2/a^2-3/a^2*arccot(a*x)*ln(1-(a*x+I)/(a^2*x^2+1)^(1/2))-3/a^2*arcc
ot(a*x)*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2))+3*I/a^2*polylog(2,-(a*x+I)/(a^2*x^2
+1)^(1/2))+3*I/a^2*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x\,\text{arccot}\,(ax)^3\,,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x*arccot(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\,\text{acot}^3\,(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(a*x)**3,x)
```

```
[Out] Integral(x*acot(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}(ax)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(x*arccot(a*x)^3, x)
```

3.28 $\int \cot^{-1}(ax)^3\,dx$

Optimal. Leaf size=96

$$-\frac{3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a}+\frac{3i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a}+x\cot^{-1}(ax)^3+\frac{i\cot^{-1}(ax)^3}{a}-\frac{3\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax}{a}$$

```
[Out] (I*ArcCot[a*x]^3)/a + x*ArcCot[a*x]^3 - (3*ArcCot[a*x]^2*Log[2/(1 + I*a*x)]
)/a + ((3*I)*ArcCot[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a - (3*PolyLog[3, 1
 - 2/(1 + I*a*x)])/(2*a)
```

Rubi [A] time = 0.149912, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1., Rules used = {4847, 4921, 4855, 4885, 4995, 6610}

$$-\frac{3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a}+\frac{3i\cot^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a}+x\cot^{-1}(ax)^3+\frac{i\cot^{-1}(ax)^3}{a}-\frac{3\log\left(\frac{2}{1+iax}\right)\cot^{-1}(ax}{a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^3,x]
```

```
[Out] (I*ArcCot[a*x]^3)/a + x*ArcCot[a*x]^3 - (3*ArcCot[a*x]^2*Log[2/(1 + I*a*x)]
)/a + ((3*I)*ArcCot[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a - (3*PolyLog[3, 1
 - 2/(1 + I*a*x)])/(2*a)
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$
\begin{aligned}
\int \cot^{-1}(ax)^3\,dx &= x\cot^{-1}(ax)^3+(3a)\int \frac{x\cot^{-1}(ax)^2}{1+a^2x^2}\,dx\\
&= \frac{i\cot^{-1}(ax)^3}{a}+x\cot^{-1}(ax)^3-3\int \frac{\cot^{-1}(ax)^2}{i-ax}\,dx\\
&= \frac{i\cot^{-1}(ax)^3}{a}+x\cot^{-1}(ax)^3-\frac{3\cot^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a}-6\int \frac{\cot^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx\\
&= \frac{i\cot^{-1}(ax)^3}{a}+x\cot^{-1}(ax)^3-\frac{3\cot^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a}+\frac{3i\cot^{-1}(ax)\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{a}+3i\int \frac{\mathrm{Li}_2\left(1-\right.}{1+a^2}\\
&= \frac{i\cot^{-1}(ax)^3}{a}+x\cot^{-1}(ax)^3-\frac{3\cot^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a}+\frac{3i\cot^{-1}(ax)\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{a}-\frac{3\mathrm{Li}_3\left(1-\frac{2}{1+iax}\right.}{2a}
\end{aligned}
$$

Mathematica [A] time = 0.104136, size = 90, normalized size = 0.94

$$-\frac{3i\cot^{-1}(ax)\text{PolyLog}\left(2,e^{-2i\cot^{-1}(ax)}\right)}{a}-\frac{3\text{PolyLog}\left(3,e^{-2i\cot^{-1}(ax)}\right)}{2a}+x\cot^{-1}(ax)^3-\frac{i\cot^{-1}(ax)^3}{a}-\frac{3\cot^{-1}(ax)^2\log(}{a}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^3,x]
```

```
[Out] ((-I)*ArcCot[a*x]^3)/a + x*ArcCot[a*x]^3 - (3*ArcCot[a*x]^2*Log[1 - E^((-2*
I)*ArcCot[a*x])])/a - ((3*I)*ArcCot[a*x]*PolyLog[2, E^((-2*I)*ArcCot[a*x])]
)/a - (3*PolyLog[3, E^((-2*I)*ArcCot[a*x])])/(2*a)
```

Maple [B] time = 0.163, size = 199, normalized size = 2.1

$$x(\text{arccot}(ax))^3+\frac{i(\text{arccot}(ax))^3}{a}-3\frac{(\text{arccot}(ax))^2}{a}\ln\left(1-\frac{ax+i}{\sqrt{a^2x^2+1}}\right)-3\frac{(\text{arccot}(ax))^2}{a}\ln\left(1+\frac{ax+i}{\sqrt{a^2x^2+1}}\right)+\frac{6ia}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^3,x)
```

```
[Out] x*arccot(a*x)^3+I*arccot(a*x)^3/a-3/a*arccot(a*x)^2*ln(1-(a*x+I)/(a^2*x^2+1
)^(1/2))-3/a*arccot(a*x)^2*ln(1+(a*x+I)/(a^2*x^2+1)^(1/2))+6*I/a*arccot(a*x
)*polylog(2,(a*x+I)/(a^2*x^2+1)^(1/2))+6*I/a*arccot(a*x)*polylog(2,-(a*x+I)
/(a^2*x^2+1)^(1/2))-6/a*polylog(3,-(a*x+I)/(a^2*x^2+1)^(1/2))-6/a*polylog(3
,(a*x+I)/(a^2*x^2+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{8}x\arctan(1,ax)^3-\frac{3}{32}x\arctan(1,ax)\log\left(a^2x^2+1\right)^2+\frac{21\arctan(ax)^2\arctan\left(\frac{1}{ax}\right)^2}{16a}+\frac{7\arctan(ax)\arctan\left(\frac{1}{ax}\right)^3}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/8*x*arctan2(1, a*x)^3 - 3/32*x*arctan2(1, a*x)*log(a^2*x^2 + 1)^2 + 21/16
*arctan(a*x)^2*arctan(1/(a*x))^2/a + 7/8*arctan(a*x)*arctan(1/(a*x))^3/a +
28*a^2*integrate(1/32*x^2*arctan(1/(a*x))^3/(a^2*x^2 + 1), x) + 3*a^2*integ
rate(1/32*x^2*arctan(1/(a*x))*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 12*a^2
*integrate(1/32*x^2*arctan(1/(a*x))*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) + 12
*a*integrate(1/32*x*arctan(1/(a*x))^2/(a^2*x^2 + 1), x) - 3*a*integrate(1/3
2*x*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 7/32*(a*arctan(a*x)^4 + 4*a*arct
an(a*x)^3*arctan(1/(a*x)))/a^2 + 3*integrate(1/32*arctan(1/(a*x))*log(a^2*x
^2 + 1)^2/(a^2*x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\operatorname{arccot}(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}^3(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**3,x)
```

```
[Out] Integral(acot(a*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^3, x)
```

3.29 $\int \frac{\cot^{-1}(ax)^3}{x} \, dx$

Optimal. Leaf size=178

$$\frac{3}{4}i\text{PolyLog}\left(4,1-\frac{2i}{ax+i}\right)-\frac{3}{4}i\text{PolyLog}\left(4,1-\frac{2ax}{ax+i}\right)-\frac{3}{2}i\cot^{-1}(ax)^2\text{PolyLog}\left(2,1-\frac{2i}{ax+i}\right)+\frac{3}{2}i\cot^{-1}(ax)^2\text{PolyLo}$$

```
[Out] 2*ArcCot[a*x]^3*ArcCoth[1 - 2/(1 + I*a*x)] - ((3*I)/2)*ArcCot[a*x]^2*PolyLo
g[2, 1 - (2*I)/(I + a*x)] + ((3*I)/2)*ArcCot[a*x]^2*PolyLog[2, 1 - (2*a*x)/
(I + a*x)] - (3*ArcCot[a*x]*PolyLog[3, 1 - (2*I)/(I + a*x)])/2 + (3*ArcCot[
a*x]*PolyLog[3, 1 - (2*a*x)/(I + a*x)])/2 + ((3*I)/4)*PolyLog[4, 1 - (2*I)/
(I + a*x)] - ((3*I)/4)*PolyLog[4, 1 - (2*a*x)/(I + a*x)]
```

Rubi [A] time = 0.326695, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {4851, 4989, 4885, 4993, 4997, 6610}

$$\frac{3}{4}i\text{PolyLog}\left(4,1-\frac{2i}{ax+i}\right)-\frac{3}{4}i\text{PolyLog}\left(4,1-\frac{2ax}{ax+i}\right)-\frac{3}{2}i\cot^{-1}(ax)^2\text{PolyLog}\left(2,1-\frac{2i}{ax+i}\right)+\frac{3}{2}i\cot^{-1}(ax)^2\text{PolyLo}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^3/x,x]
```

```
[Out] 2*ArcCot[a*x]^3*ArcCoth[1 - 2/(1 + I*a*x)] - ((3*I)/2)*ArcCot[a*x]^2*PolyLo
g[2, 1 - (2*I)/(I + a*x)] + ((3*I)/2)*ArcCot[a*x]^2*PolyLog[2, 1 - (2*a*x)/
(I + a*x)] - (3*ArcCot[a*x]*PolyLog[3, 1 - (2*I)/(I + a*x)])/2 + (3*ArcCot[
a*x]*PolyLog[3, 1 - (2*a*x)/(I + a*x)])/2 + ((3*I)/4)*PolyLog[4, 1 - (2*I)/
(I + a*x)] - ((3*I)/4)*PolyLog[4, 1 - (2*a*x)/(I + a*x)]
```

Rule 4851

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcCot[c*x])^p*ArcCoth[1 - 2/(1 + I*c*x)], x] + Dist[2*b*c*p, Int[((a + b
*ArcCot[c*x])^(p - 1)*ArcCoth[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4989

```
Int[(ArcCoth[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[SimplifyIntegrand[1 + 1/u, x]]*(a +
```

```
b*ArcCot[c*x])^p)/(d + e*x^2), x], x] - Dist[1/2, Int[(Log[SimplifyIntegran
d[1 - 1/u, x]]*(a + b*ArcCot[c*x])^p)/(d + e*x^2), x], x] /; FreeQ[{a, b, c
, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x
))^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4993

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] + Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4997

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^3}{x}\,dx = 2\cot^{-1}(ax)^3\coth^{-1}\left(1-\frac{2}{1+iax}\right)+(6a)\int\frac{\cot^{-1}(ax)^2\coth^{-1}\left(1-\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx$$

$$= 2\cot^{-1}(ax)^3\coth^{-1}\left(1-\frac{2}{1+iax}\right)-(3a)\int\frac{\cot^{-1}(ax)^2\log\left(\frac{2i}{i+ax}\right)}{1+a^2x^2}\,dx+(3a)\int\frac{\cot^{-1}(ax)^2\log\left(\frac{2ax}{i+ax}\right)}{1+a^2x^2}$$

$$= 2\cot^{-1}(ax)^3\coth^{-1}\left(1-\frac{2}{1+iax}\right)-\frac{3}{2}i\cot^{-1}(ax)^2\text{Li}_2\left(1-\frac{2i}{i+ax}\right)+\frac{3}{2}i\cot^{-1}(ax)^2\text{Li}_2\left(1-\frac{2ax}{i+ax}\right)-$$

$$= 2\cot^{-1}(ax)^3\coth^{-1}\left(1-\frac{2}{1+iax}\right)-\frac{3}{2}i\cot^{-1}(ax)^2\text{Li}_2\left(1-\frac{2i}{i+ax}\right)+\frac{3}{2}i\cot^{-1}(ax)^2\text{Li}_2\left(1-\frac{2ax}{i+ax}\right)-$$

$$= 2\cot^{-1}(ax)^3\coth^{-1}\left(1-\frac{2}{1+iax}\right)-\frac{3}{2}i\cot^{-1}(ax)^2\text{Li}_2\left(1-\frac{2i}{i+ax}\right)+\frac{3}{2}i\cot^{-1}(ax)^2\text{Li}_2\left(1-\frac{2ax}{i+ax}\right)-$$

Mathematica [A] time = 0.0757724, size = 180, normalized size = 1.01

$$\frac{1}{64}i\left(-96\cot^{-1}(ax)^2\text{PolyLog}\left(2,e^{-2i\cot^{-1}(ax)}\right)-96\cot^{-1}(ax)^2\text{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right)+96i\cot^{-1}(ax)\text{PolyLog}\left(3,e^{-2i}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^3/x,x]
```

```
[Out] (I/64)*(Pi^4 - 32*ArcCot[a*x]^4 + (64*I)*ArcCot[a*x]^3*Log[1 - E^((-2*I)*Ar
cCot[a*x])] - (64*I)*ArcCot[a*x]^3*Log[1 + E^((2*I)*ArcCot[a*x])] - 96*ArcC
ot[a*x]^2*PolyLog[2, E^((-2*I)*ArcCot[a*x])] - 96*ArcCot[a*x]^2*PolyLog[2,
-E^((2*I)*ArcCot[a*x])] + (96*I)*ArcCot[a*x]*PolyLog[3, E^((-2*I)*ArcCot[a*
x])] - (96*I)*ArcCot[a*x]*PolyLog[3, -E^((2*I)*ArcCot[a*x])] + 48*PolyLog[4
, E^((-2*I)*ArcCot[a*x])] + 48*PolyLog[4, -E^((2*I)*ArcCot[a*x])])
```

Maple [C] time = 0.412, size = 1050, normalized size = 5.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^3/x,x)
```

```
[Out] ln(a*x)*arccot(a*x)^3+arccot(a*x)^3*ln((a*x+I)^2/(a^2*x^2+1)-1)-arccot(a*x)
^3*ln(1-(a*x+I)/(a^2*x^2+1)^(1/2))+3/4*I*polylog(4,-(a*x+I)^2/(a^2*x^2+1))-
6*arccot(a*x)*polylog(3,(a*x+I)/(a^2*x^2+1)^(1/2))+1/2*I*Pi*csgn(I/((a*x+I)
^2/(a^2*x^2+1)-1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+
1))*csgn(I*((a*x+I)^2/(a^2*x^2+1)+1))*arccot(a*x)^3-arccot(a*x)^3*ln(1+(a*x
+I)/(a^2*x^2+1)^(1/2))-6*I*polylog(4,-(a*x+I)/(a^2*x^2+1)^(1/2))-6*arccot(a
*x)*polylog(3,-(a*x+I)/(a^2*x^2+1)^(1/2))+3*I*arccot(a*x)^2*polylog(2,(a*x+
I)/(a^2*x^2+1)^(1/2))+1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/
(a^2*x^2+1)+1))*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))
*arccot(a*x)^3-1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1))*csgn(I/((a*x+I)^2
/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2*arccot(a*x)^3-3/2*I*arccot(a*x
)^2*polylog(2,-(a*x+I)^2/(a^2*x^2+1))-1/2*I*Pi*arccot(a*x)^3+3/2*arccot(a*x
)*polylog(3,-(a*x+I)^2/(a^2*x^2+1))-1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-
1)*((a*x+I)^2/(a^2*x^2+1)+1))*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(
a^2*x^2+1)+1))^2*arccot(a*x)^3-6*I*polylog(4,(a*x+I)/(a^2*x^2+1)^(1/2))-1/2
*I*Pi*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^3*arccot(
a*x)^3+3*I*arccot(a*x)^2*polylog(2,-(a*x+I)/(a^2*x^2+1)^(1/2))-1/2*I*Pi*csg
n(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2*csgn(I*((a*x+I)^
2/(a^2*x^2+1)+1))*arccot(a*x)^3+1/2*I*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*(
(a*x+I)^2/(a^2*x^2+1)+1))^3*arccot(a*x)^3+1/2*I*Pi*csgn(1/((a*x+I)^2/(a^2*x
^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2*arccot(a*x)^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x,x, algorithm="maxima")
```

```
[Out] integrate(arccot(a*x)^3/x, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)^3}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^3/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^3(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**3/x,x)
```

```
[Out] Integral(acot(a*x)**3/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^3/x, x)
```

3.30 $\int \frac{\cot^{-1}(ax)^3}{x^2} dx$

Optimal. Leaf size=93

$$-\frac{3}{2}a\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)-3ia\cot^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-ia\cot^{-1}(ax)^3-\frac{\cot^{-1}(ax)^3}{x}-3a\log\left(2-\frac{}{1}\right.$$

```
[Out] (-I)*a*ArcCot[a*x]^3 - ArcCot[a*x]^3/x - 3*a*ArcCot[a*x]^2*Log[2 - 2/(1 - I
*a*x)] - (3*I)*a*ArcCot[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)] - (3*a*PolyLog[
3, -1 + 2/(1 - I*a*x)])/2
```

Rubi [A] time = 0.188242, antiderivative size = 93, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {4853, 4925, 4869, 4885, 4993, 6610}

$$-\frac{3}{2}a\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)-3ia\cot^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-ia\cot^{-1}(ax)^3-\frac{\cot^{-1}(ax)^3}{x}-3a\log\left(2-\frac{}{1}\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^3/x^2,x]
```

```
[Out] (-I)*a*ArcCot[a*x]^3 - ArcCot[a*x]^3/x - 3*a*ArcCot[a*x]^2*Log[2 - 2/(1 - I
*a*x)] - (3*I)*a*ArcCot[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)] - (3*a*PolyLog[
3, -1 + 2/(1 - I*a*x)])/2
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4993

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] + Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^3}{x^2}\,dx = -\frac{\cot^{-1}(ax)^3}{x} - (3a)\int \frac{\cot^{-1}(ax)^2}{x\left(1+a^2x^2\right)}\,dx$$

$$= -ia\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{x} - (3ia)\int \frac{\cot^{-1}(ax)^2}{x(i+ax)}\,dx$$

$$= -ia\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{x} - 3a\cot^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right) - \left(6a^2\right)\int \frac{\cot^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx$$

$$= -ia\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{x} - 3a\cot^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right) - 3ia\cot^{-1}(ax)\mathrm{Li}_2\left(-1+\frac{2}{1-iax}\right) - (\ldots$$

$$= -ia\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{x} - 3a\cot^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right) - 3ia\cot^{-1}(ax)\mathrm{Li}_2\left(-1+\frac{2}{1-iax}\right) - \frac{3\ldots}{2\ldots}$$

Mathematica [A] time = 0.0720911, size = 83, normalized size = 0.89

$$3ia\cot^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right)-\frac{3}{2}a\text{PolyLog}\left(3,-e^{2i\cot^{-1}(ax)}\right)+\frac{(-1+iax)\cot^{-1}(ax)^3}{x}-3a\cot^{-1}(ax)^2\log\left(1+\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^3/x^2,x]
```

```
[Out] ((-1 + I*a*x)*ArcCot[a*x]^3)/x - 3*a*ArcCot[a*x]^2*Log[1 + E^((2*I)*ArcCot[
a*x])] + (3*I)*a*ArcCot[a*x]*PolyLog[2, -E^((2*I)*ArcCot[a*x])] - (3*a*Poly
Log[3, -E^((2*I)*ArcCot[a*x])])/2
```

Maple [C] time = 0.574, size = 1576, normalized size = 17.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^3/x^2,x)
```

```
[Out] -3/2*a*polylog(3,-(a*x+I)^2/(a^2*x^2+1))+3/2*I*a*arccot(a*x)^2*Pi*csgn(1/((
a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^3-3/2*I*a*arccot(a*x)^2*
Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^3+3/4*I*a*ar
ccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))^3-3/4*I*a*arccot(a*x)^2*Pi*csg
n(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^3-3/4*I*a*arccot(a*x
)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^3-3/2*I*a*arccot(a*x)^2*Pi*csgn(
1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2-3/4*I*a*arccot(a*x
)^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)
)^2-3/2*I*a*arccot(a*x)^2*Pi*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a
^2*x^2+1)+1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))+3
/2*I*a*arccot(a*x)^2*Pi*csgn(1/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^
2+1)+1))^2*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))+3/2*
I*a*arccot(a*x)^2*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1
)+1))^2*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1))+3/2*I*a*arccot(a*x)^2*Pi*csgn(I/(
(a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)+1))^2*csgn(I*((a*x+I)^2/(a^
2*x^2+1)+1))+3/4*I*a*arccot(a*x)^2*Pi*csgn(I*(a*x+I)/(a^2*x^2+1)^(1/2))^2*c
sgn(I*(a*x+I)^2/(a^2*x^2+1))-3/2*I*a*arccot(a*x)^2*Pi*csgn(I*(a*x+I)/(a^2*x
^2+1)^(1/2))*csgn(I*(a*x+I)^2/(a^2*x^2+1))^2-3/4*I*a*arccot(a*x)^2*Pi*csgn(
I*(a*x+I)^2/(a^2*x^2+1))*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1
)-1)^2)^2-3/4*I*a*arccot(a*x)^2*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)^2)*csgn
(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)^2+3/2*I*a*arccot(a*x)
```

```
^2*Pi*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1)^2)^2*csgn(I*((a*x+I)^2/(a^2*x^2+1)-1
))+I*a*arccot(a*x)^3+3/2*a*arccot(a*x)^2*ln(a^2*x^2+1)-3*a*ln(a*x)*arccot(a
*x)^2-3*a*arccot(a*x)^2*ln((a*x+I)/(a^2*x^2+1)^(1/2))-3*a*arccot(a*x)^2*ln(
2)+3*I*a*arccot(a*x)*polylog(2,-(a*x+I)^2/(a^2*x^2+1))+3/4*I*a*arccot(a*x)^
2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)^2)*csgn
(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-1)^2)-arccot(a*x)^3/x-3/2*I
*a*arccot(a*x)^2*Pi*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1)*((a*x+I)^2/(a^2*x^2+1)
+1))*csgn(I/((a*x+I)^2/(a^2*x^2+1)-1))*csgn(I*((a*x+I)^2/(a^2*x^2+1)+1))+3/
2*I*a*arccot(a*x)^2*Pi*csgn(I*(a*x+I)^2/(a^2*x^2+1)/((a*x+I)^2/(a^2*x^2+1)-
1)^2)^2
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)^3}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^2,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^3/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^3(ax)}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**3/x**2,x)
```

```
[Out] Integral(acot(a*x)**3/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^2,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^3/x^2, x)
```

3.31 $\int \frac{\cot^{-1}(ax)^3}{x^3}\,dx$

Optimal. Leaf size=105

$$\frac{3}{2}ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{1}{2}a^2\cot^{-1}(ax)^3+\frac{3}{2}ia^2\cot^{-1}(ax)^2+3a^2\log\left(2-\frac{2}{1-iax}\right)\cot^{-1}(ax)-\frac{\cot^{-1}(ax)^3}{2x^2}+\frac{3a}{}$$

```
[Out] ((3*I)/2)*a^2*ArcCot[a*x]^2 + (3*a*ArcCot[a*x]^2)/(2*x) - (a^2*ArcCot[a*x]^
3)/2 - ArcCot[a*x]^3/(2*x^2) + 3*a^2*ArcCot[a*x]*Log[2 - 2/(1 - I*a*x)] + (
(3*I)/2)*a^2*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rubi [A] time = 0.199437, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {4853, 4919, 4925, 4869, 2447, 4885}

$$\frac{3}{2}ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{1}{2}a^2\cot^{-1}(ax)^3+\frac{3}{2}ia^2\cot^{-1}(ax)^2+3a^2\log\left(2-\frac{2}{1-iax}\right)\cot^{-1}(ax)-\frac{\cot^{-1}(ax)^3}{2x^2}+\frac{3a}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^3/x^3,x]
```

```
[Out] ((3*I)/2)*a^2*ArcCot[a*x]^2 + (3*a*ArcCot[a*x]^2)/(2*x) - (a^2*ArcCot[a*x]^
3)/2 - ArcCot[a*x]^3/(2*x^2) + 3*a^2*ArcCot[a*x]*Log[2 - 2/(1 - I*a*x)] + (
(3*I)/2)*a^2*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^3}{x^3}\,dx = -\frac{\cot^{-1}(ax)^3}{2x^2} - \frac{1}{2}(3a)\int \frac{\cot^{-1}(ax)^2}{x^2\left(1+a^2x^2\right)}\,dx$$
$$= -\frac{\cot^{-1}(ax)^3}{2x^2} - \frac{1}{2}(3a)\int \frac{\cot^{-1}(ax)^2}{x^2}\,dx + \frac{1}{2}\left(3a^3\right)\int \frac{\cot^{-1}(ax)^2}{1+a^2x^2}\,dx$$
$$= \frac{3a\cot^{-1}(ax)^2}{2x} - \frac{1}{2}a^2\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{2x^2} + \left(3a^2\right)\int \frac{\cot^{-1}(ax)}{x\left(1+a^2x^2\right)}\,dx$$
$$= \frac{3}{2}ia^2\cot^{-1}(ax)^2 + \frac{3a\cot^{-1}(ax)^2}{2x} - \frac{1}{2}a^2\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{2x^2} + \left(3ia^2\right)\int \frac{\cot^{-1}(ax)}{x(i+ax)}\,dx$$
$$= \frac{3}{2}ia^2\cot^{-1}(ax)^2 + \frac{3a\cot^{-1}(ax)^2}{2x} - \frac{1}{2}a^2\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{2x^2} + 3a^2\cot^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right) +$$
$$= \frac{3}{2}ia^2\cot^{-1}(ax)^2 + \frac{3a\cot^{-1}(ax)^2}{2x} - \frac{1}{2}a^2\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{2x^2} + 3a^2\cot^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right) +$$

Mathematica [A] time = 0.160054, size = 90, normalized size = 0.86

$$-\frac{3}{2}ia^2\text{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right) - \frac{\cot^{-1}(ax)\left(\left(a^2x^2+1\right)\cot^{-1}(ax)^2 - 6a^2x^2\log\left(1+e^{2i\cot^{-1}(ax)}\right) + 3iax(ax+i)\cot^{-1}(ax)\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^3/x^3,x]
```

```
[Out] -(ArcCot[a*x]*((3*I)*a*x*(I + a*x)*ArcCot[a*x] + (1 + a^2*x^2)*ArcCot[a*x]^
2 - 6*a^2*x^2*Log[1 + E^((2*I)*ArcCot[a*x])]))/(2*x^2) - ((3*I)/2)*a^2*Poly
Log[2, -E^((2*I)*ArcCot[a*x])]
```

Maple [A] time = 0.322, size = 109, normalized size = 1.

$$-\frac{(\operatorname{arccot}(ax))^3}{2x^2} - \frac{a^2(\operatorname{arccot}(ax))^3}{2} - \frac{3i}{2}a^2(\operatorname{arccot}(ax))^2 + \frac{3a(\operatorname{arccot}(ax))^2}{2x} + 3a^2\operatorname{arccot}(ax)\ln\left(\frac{(ax+i)^2}{a^2x^2+1}+1\right) - \frac{3i}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^3/x^3,x)
```

```
[Out] -1/2*arccot(a*x)^3/x^2-1/2*a^2*arccot(a*x)^3-3/2*I*a^2*arccot(a*x)^2+3/2*a*
arccot(a*x)^2/x+3*a^2*arccot(a*x)*ln((a*x+I)^2/(a^2*x^2+1)+1)-3/2*I*a^2*pol
ylog(2,-(a*x+I)^2/(a^2*x^2+1))
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\text{arccot}\,(ax)^3}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^3,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^3/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\text{acot}^3\,(ax)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**3/x**3,x)
```

```
[Out] Integral(acot(a*x)**3/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^3,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^3/x^3, x)
```

3.32 $\int \frac{\cot^{-1}(ax)^3}{x^4}\,dx$

Optimal. Leaf size=167

$$\frac{1}{2}a^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+ia^3\cot^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{1}{2}a^3\log\left(a^2x^2+1\right)-a^3\log(x)+\frac{1}{3}ia^3\cot^{-1}$$

```
[Out] -((a^2*ArcCot[a*x])/x) + (a^3*ArcCot[a*x]^2)/2 + (a*ArcCot[a*x]^2)/(2*x^2)
+ (I/3)*a^3*ArcCot[a*x]^3 - ArcCot[a*x]^3/(3*x^3) - a^3*Log[x] + (a^3*Log[1
 + a^2*x^2])/2 + a^3*ArcCot[a*x]^2*Log[2 - 2/(1 - I*a*x)] + I*a^3*ArcCot[a*
x]*PolyLog[2, -1 + 2/(1 - I*a*x)] + (a^3*PolyLog[3, -1 + 2/(1 - I*a*x)])/2
```

Rubi [A] time = 0.336865, antiderivative size = 167, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.1, Rules used = {4853, 4919, 266, 36, 29, 31, 4885, 4925, 4869, 4993, 6610}

$$\frac{1}{2}a^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+ia^3\cot^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{1}{2}a^3\log\left(a^2x^2+1\right)-a^3\log(x)+\frac{1}{3}ia^3\cot^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^3/x^4,x]
```


```
[Out] -((a^2*ArcCot[a*x])/x) + (a^3*ArcCot[a*x]^2)/2 + (a*ArcCot[a*x]^2)/(2*x^2)
+ (I/3)*a^3*ArcCot[a*x]^3 - ArcCot[a*x]^3/(3*x^3) - a^3*Log[x] + (a^3*Log[1
 + a^2*x^2])/2 + a^3*ArcCot[a*x]^2*Log[2 - 2/(1 - I*a*x)] + I*a^3*ArcCot[a*
x]*PolyLog[2, -1 + 2/(1 - I*a*x)] + (a^3*PolyLog[3, -1 + 2/(1 - I*a*x)])/2
```


Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
```

```
x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4993

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] + Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^3}{x^4}\,dx = -\frac{\cot^{-1}(ax)^3}{3x^3} - a\int \frac{\cot^{-1}(ax)^2}{x^3\left(1+a^2x^2\right)}\,dx$$

$$= -\frac{\cot^{-1}(ax)^3}{3x^3} - a\int \frac{\cot^{-1}(ax)^2}{x^3}\,dx + a^3\int \frac{\cot^{-1}(ax)^2}{x\left(1+a^2x^2\right)}\,dx$$

$$= \frac{a\cot^{-1}(ax)^2}{2x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{3x^3} + a^2\int \frac{\cot^{-1}(ax)}{x^2\left(1+a^2x^2\right)}\,dx + \left(ia^3\right)\int \frac{\cot^{-1}(ax)^2}{x(i+ax)}\,dx$$

$$= \frac{a\cot^{-1}(ax)^2}{2x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{3x^3} + a^3\cot^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right) + a^2\int \frac{\cot^{-1}(ax)}{x^2}\,d$$

$$= -\frac{a^2\cot^{-1}(ax)}{x} + \frac{1}{2}a^3\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{2x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{3x^3} + a^3\cot^{-1}(ax)^2\log$$

$$= -\frac{a^2\cot^{-1}(ax)}{x} + \frac{1}{2}a^3\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{2x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{3x^3} + a^3\cot^{-1}(ax)^2\log$$

$$= -\frac{a^2\cot^{-1}(ax)}{x} + \frac{1}{2}a^3\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{2x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{3x^3} + a^3\cot^{-1}(ax)^2\log$$

$$= -\frac{a^2\cot^{-1}(ax)}{x} + \frac{1}{2}a^3\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{2x^2} + \frac{1}{3}ia^3\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{3x^3} - a^3\log(x) + \frac{1}{2}a^3$$

Mathematica [A] time = 0.243506, size = 151, normalized size = 0.9

$$\frac{1}{6}\left(-6ia^3\cot^{-1}(ax)\text{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right) + 3a^3\text{PolyLog}\left(3,-e^{2i\cot^{-1}(ax)}\right) - 6a^3\log\left(\frac{1}{\sqrt{\frac{1}{a^2x^2}+1}}\right) - 2ia^3\cot^{-1}(ax)^3 +\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^3/x^4,x]
```

```
[Out] ((-6*a^2*ArcCot[a*x])/x + 3*a^3*ArcCot[a*x]^2 + (3*a*ArcCot[a*x]^2)/x^2 - (
2*I)*a^3*ArcCot[a*x]^3 - (2*ArcCot[a*x]^3)/x^3 + 6*a^3*ArcCot[a*x]^2*Log[1
+ E^((2*I)*ArcCot[a*x])] - 6*a^3*Log[1/Sqrt[1 + 1/(a^2*x^2)]] - (6*I)*a^3*A
rcCot[a*x]*PolyLog[2, -E^((2*I)*ArcCot[a*x])] + 3*a^3*PolyLog[3, -E^((2*I)*
ArcCot[a*x])])/6
```

Maple [C] time = 1.627, size = 5029, normalized size = 30.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^3/x^4,x)
```

```
[Out] result too large to display
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)^3}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^4,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^3/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^3(ax)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**3/x**4,x)
```

```
[Out] Integral(acot(a*x)**3/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^3}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^4,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^3/x^4, x)
```

3.33 $\int \frac{\cot^{-1}(ax)^3}{x^5} \, dx$

Optimal. Leaf size=152

$$-ia^4\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{a^2\cot^{-1}(ax)}{4x^2}+\frac{a^3}{4x}+\frac{1}{4}a^4\tan^{-1}(ax)+\frac{1}{4}a^4\cot^{-1}(ax)^3-ia^4\cot^{-1}(ax)^2-\frac{3a^3\cot^{-1}(ax)}{4x}$$

```
[Out] a^3/(4*x) - (a^2*ArcCot[a*x])/(4*x^2) - I*a^4*ArcCot[a*x]^2 + (a*ArcCot[a*x
]^2)/(4*x^3) - (3*a^3*ArcCot[a*x]^2)/(4*x) + (a^4*ArcCot[a*x]^3)/4 - ArcCot
[a*x]^3/(4*x^4) + (a^4*ArcTan[a*x])/4 - 2*a^4*ArcCot[a*x]*Log[2 - 2/(1 - I*
a*x)] - I*a^4*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rubi [A] time = 0.419914, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8, Rules used = {4853, 4919, 325, 203, 4925, 4869, 2447, 4885}

$$-ia^4\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{a^2\cot^{-1}(ax)}{4x^2}+\frac{a^3}{4x}+\frac{1}{4}a^4\tan^{-1}(ax)+\frac{1}{4}a^4\cot^{-1}(ax)^3-ia^4\cot^{-1}(ax)^2-\frac{3a^3\cot^{-1}(ax)}{4x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]^3/x^5,x]
```

```
[Out] a^3/(4*x) - (a^2*ArcCot[a*x])/(4*x^2) - I*a^4*ArcCot[a*x]^2 + (a*ArcCot[a*x
]^2)/(4*x^3) - (3*a^3*ArcCot[a*x]^2)/(4*x) + (a^4*ArcCot[a*x]^3)/4 - ArcCot
[a*x]^3/(4*x^4) + (a^4*ArcTan[a*x])/4 - 2*a^4*ArcCot[a*x]*Log[2 - 2/(1 - I*
a*x)] - I*a^4*PolyLog[2, -1 + 2/(1 - I*a*x)]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
```

```
x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)^3}{x^5}\,dx = -\frac{\cot^{-1}(ax)^3}{4x^4} - \frac{1}{4}(3a)\int \frac{\cot^{-1}(ax)^2}{x^4\left(1+a^2x^2\right)}\,dx$$

$$= -\frac{\cot^{-1}(ax)^3}{4x^4} - \frac{1}{4}(3a)\int \frac{\cot^{-1}(ax)^2}{x^4}\,dx + \frac{1}{4}\left(3a^3\right)\int \frac{\cot^{-1}(ax)^2}{x^2\left(1+a^2x^2\right)}\,dx$$

$$= \frac{a\cot^{-1}(ax)^2}{4x^3} - \frac{\cot^{-1}(ax)^3}{4x^4} + \frac{1}{2}a^2\int \frac{\cot^{-1}(ax)}{x^3\left(1+a^2x^2\right)}\,dx + \frac{1}{4}\left(3a^3\right)\int \frac{\cot^{-1}(ax)^2}{x^2}\,dx - \frac{1}{4}\left(3a^5\right)\int \frac{\cot^{-1}}{1+a}$$

$$= \frac{a\cot^{-1}(ax)^2}{4x^3} - \frac{3a^3\cot^{-1}(ax)^2}{4x} + \frac{1}{4}a^4\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{4x^4} + \frac{1}{2}a^2\int \frac{\cot^{-1}(ax)}{x^3}\,dx - \frac{1}{2}a^4\int \frac{\cot}{x(1-}$$

$$= -\frac{a^2\cot^{-1}(ax)}{4x^2} - ia^4\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{4x^3} - \frac{3a^3\cot^{-1}(ax)^2}{4x} + \frac{1}{4}a^4\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{4x^4} - \frac{1}{4}$$

$$= \frac{a^3}{4x} - \frac{a^2\cot^{-1}(ax)}{4x^2} - ia^4\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{4x^3} - \frac{3a^3\cot^{-1}(ax)^2}{4x} + \frac{1}{4}a^4\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{4x^4}$$

$$= \frac{a^3}{4x} - \frac{a^2\cot^{-1}(ax)}{4x^2} - ia^4\cot^{-1}(ax)^2 + \frac{a\cot^{-1}(ax)^2}{4x^3} - \frac{3a^3\cot^{-1}(ax)^2}{4x} + \frac{1}{4}a^4\cot^{-1}(ax)^3 - \frac{\cot^{-1}(ax)^3}{4x^4}$$

Mathematica [A] time = 0.258419, size = 126, normalized size = 0.83

$$\frac{4ia^4x^4\text{PolyLog}\left(2,-e^{2i\cot^{-1}(ax)}\right) + a^3x^3 + \left(a^4x^4-1\right)\cot^{-1}(ax)^3 + \left(4ia^4x^4 - 3a^3x^3 + ax\right)\cot^{-1}(ax)^2 - a^2x^2\cot^{-1}(ax)\left(a^2\right.}{4x^4}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]^3/x^5,x]
```

```
[Out] (a^3*x^3 + (a*x - 3*a^3*x^3 + (4*I)*a^4*x^4)*ArcCot[a*x]^2 + (-1 + a^4*x^4)
*ArcCot[a*x]^3 - a^2*x^2*ArcCot[a*x]*(1 + a^2*x^2 + 8*a^2*x^2*Log[1 + E^((2
*I)*ArcCot[a*x])]) + (4*I)*a^4*x^4*PolyLog[2, -E^((2*I)*ArcCot[a*x])])/(4*x
^4)
```

Maple [A] time = 0.485, size = 158, normalized size = 1.

$$-\frac{(\text{arccot}(ax))^3}{4x^4} + \frac{a^4(\text{arccot}(ax))^3}{4} + ia^4(\text{arccot}(ax))^2 - \frac{a^4\text{arccot}(ax)}{4} - \frac{3a^3(\text{arccot}(ax))^2}{4x} + \frac{i}{4}a^4 + \frac{a^3}{4x} - \frac{a^2\text{arccot}(}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)^3/x^5,x)
```

```
[Out] -1/4*arccot(a*x)^3/x^4+1/4*a^4*arccot(a*x)^3+I*a^4*arccot(a*x)^2-1/4*a^4*ar
ccot(a*x)-3/4*a^3*arccot(a*x)^2/x+1/4*I*a^4+1/4*a^3/x-1/4*a^2*arccot(a*x)/x
^2+1/4*a*arccot(a*x)^2/x^3-2*a^4*arccot(a*x)*ln((a*x+I)^2/(a^2*x^2+1)+1)+I*
a^4*polylog(2,-(a*x+I)^2/(a^2*x^2+1))
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^5,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}\left(ax\right)^{3}}{x^{5}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^5,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)^3/x^5, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^{3}\left(ax\right)}{x^{5}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)**3/x**5,x)
```

```
[Out] Integral(acot(a*x)**3/x**5, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)^3}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)^3/x^5,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)^3/x^5, x)
```

3.34 $\int x^m \cot^{-1}(ax)^3 \, dx$

Optimal. Leaf size=12

$$\text{Unintegrable}\left(x^m \cot^{-1}(ax)^3, x\right)$$

```
[Out] Unintegrable[x^m*ArcCot[a*x]^3, x]
```

Rubi [A] time = 0.0129573, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x^m \cot^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*ArcCot[a*x]^3,x]
```

```
[Out] Defer[Int][x^m*ArcCot[a*x]^3, x]
```

Rubi steps

$$\int x^m \cot^{-1}(ax)^3 \, dx = \int x^m \cot^{-1}(ax)^3 \, dx$$

Mathematica [A] time = 0.827706, size = 0, normalized size = 0.

$$\int x^m \cot^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*ArcCot[a*x]^3,x]
```

```
[Out] Integrate[x^m*ArcCot[a*x]^3, x]
```

Maple [A] time = 1.293, size = 0, normalized size = 0.

$$\int x^{m} \left(\operatorname{arccot}\left(a x\right)\right)^{3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arccot(a*x)^3,x)
```

```
[Out] int(x^m*arccot(a*x)^3,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^{m} \operatorname{arccot}\left(a x\right)^{3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x^m*arccot(a*x)^3, x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int x^{m} \operatorname{acot}^{3}{\left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*acot(a*x)**3,x)
```

```
[Out] Integral(x**m*acot(a*x)**3, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int x^m \operatorname{arccot}(ax)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x)^3,x, algorithm="giac")
```

```
[Out] integrate(x^m*arccot(a*x)^3, x)
```

3.35 $\int x^m \cot^{-1}(ax)^2 \, dx$

Optimal. Leaf size=12

$$\text{Unintegrable}\left(x^m \cot^{-1}(ax)^2, x\right)$$

```
[Out] Unintegrable[x^m*ArcCot[a*x]^2, x]
```

Rubi [A] time = 0.0126703, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int x^m \cot^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*ArcCot[a*x]^2,x]
```

```
[Out] Defer[Int][x^m*ArcCot[a*x]^2, x]
```

Rubi steps

$$\int x^m \cot^{-1}(ax)^2 \, dx = \int x^m \cot^{-1}(ax)^2 \, dx$$

Mathematica [A] time = 0.814933, size = 0, normalized size = 0.

$$\int x^m \cot^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*ArcCot[a*x]^2,x]
```

```
[Out] Integrate[x^m*ArcCot[a*x]^2, x]
```

Maple [A] time = 0.956, size = 0, normalized size = 0.

$$\int x^{m} (\operatorname{arccot}(ax))^{2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arccot(a*x)^2,x)
```

```
[Out] int(x^m*arccot(a*x)^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(x^{m} \operatorname{arccot}(ax)^{2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(x^m*arccot(a*x)^2, x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int x^{m} \operatorname{acot}^{2}(ax) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*acot(a*x)**2,x)
```

```
[Out] Integral(x**m*acot(a*x)**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int x^m \operatorname{arccot}(ax)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x)^2,x, algorithm="giac")
```

```
[Out] integrate(x^m*arccot(a*x)^2, x)
```

3.36 $\int x^m \cot^{-1}(ax)\, dx$

Optimal. Leaf size=57

$$\frac{ax^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}+\frac{x^{m+1}\cot^{-1}(ax)}{m+1}$$

```
[Out] (x^(1 + m)*ArcCot[a*x])/(1 + m) + (a*x^(2 + m)*Hypergeometric2F1[1, (2 + m)
/2, (4 + m)/2, -(a^2*x^2)])/(2 + 3*m + m^2)
```

Rubi [A] time = 0.020079, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {4853, 364}

$$\frac{ax^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}+\frac{x^{m+1}\cot^{-1}(ax)}{m+1}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*ArcCot[a*x],x]
```

```
[Out] (x^(1 + m)*ArcCot[a*x])/(1 + m) + (a*x^(2 + m)*Hypergeometric2F1[1, (2 + m)
/2, (4 + m)/2, -(a^2*x^2)])/(2 + 3*m + m^2)
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int x^m \cot^{-1}(ax)\,dx = \frac{x^{1+m}\cot^{-1}(ax)}{1+m} + \frac{a\int \frac{x^{1+m}}{1+a^2x^2}\,dx}{1+m}$$
$$= \frac{x^{1+m}\cot^{-1}(ax)}{1+m} + \frac{ax^{2+m}\,{}_2F_1\left(1,\frac{2+m}{2};\frac{4+m}{2};-a^2x^2\right)}{2+3m+m^2}$$

Mathematica [A] time = 0.0198512, size = 52, normalized size = 0.91

$$\frac{x^{m+1}\left(ax\,{}_2F_1\left(1,\frac{m}{2}+1;\frac{m}{2}+2;-a^2x^2\right)+(m+2)\cot^{-1}(ax)\right)}{(m+1)(m+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*ArcCot[a*x],x]
```

```
[Out] (x^(1 + m)*((2 + m)*ArcCot[a*x] + a*x*Hypergeometric2F1[1, 1 + m/2, 2 + m/2
, -(a^2*x^2)]))/((1 + m)*(2 + m))
```

Maple [F] time = 1.026, size = 0, normalized size = 0.

$$\int x^m \operatorname{arccot}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arccot(a*x),x)
```

```
[Out] int(x^m*arccot(a*x),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(x^m \operatorname{arccot}(ax), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x),x, algorithm="fricas")
```

```
[Out] integral(x^m*arccot(a*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^m \operatorname{acot}(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*acot(a*x),x)
```

```
[Out] Integral(x**m*acot(a*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^m \operatorname{arccot}(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arccot(a*x),x, algorithm="giac")
```

```
[Out] integrate(x^m*arccot(a*x), x)
```

3.37 $\int \frac{x^4 \cot^{-1}(x)}{1+x^2} \, dx$

Optimal. Leaf size=40

$$\frac{x^2}{6} - \frac{2}{3}\log\left(x^2+1\right) + \frac{1}{3}x^3\cot^{-1}(x) - x\cot^{-1}(x) - \frac{1}{2}\cot^{-1}(x)^2$$

```
[Out] x^2/6 - x*ArcCot[x] + (x^3*ArcCot[x])/3 - ArcCot[x]^2/2 - (2*Log[1 + x^2])/
3
```

Rubi [A] time = 0.0965447, antiderivative size = 40, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538, Rules used = {4917, 4853, 266, 43, 4847, 260, 4885}

$$\frac{x^2}{6} - \frac{2}{3}\log\left(x^2+1\right) + \frac{1}{3}x^3\cot^{-1}(x) - x\cot^{-1}(x) - \frac{1}{2}\cot^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcCot[x])/(1 + x^2),x]
```

```
[Out] x^2/6 - x*ArcCot[x] + (x^3*ArcCot[x])/3 - ArcCot[x]^2/2 - (2*Log[1 + x^2])/
3
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^4 \cot^{-1}(x)}{1+x^2}\,dx &= \int x^2 \cot^{-1}(x)\,dx - \int \frac{x^2 \cot^{-1}(x)}{1+x^2}\,dx \\
&= \frac{1}{3}x^3 \cot^{-1}(x) + \frac{1}{3}\int \frac{x^3}{1+x^2}\,dx - \int \cot^{-1}(x)\,dx + \int \frac{\cot^{-1}(x)}{1+x^2}\,dx \\
&= -x \cot^{-1}(x) + \frac{1}{3}x^3 \cot^{-1}(x) - \frac{1}{2}\cot^{-1}(x)^2 + \frac{1}{6}\operatorname{Subst}\left(\int \frac{x}{1+x}\,dx, x, x^2\right) - \int \frac{x}{1+x^2}\,dx \\
&= -x \cot^{-1}(x) + \frac{1}{3}x^3 \cot^{-1}(x) - \frac{1}{2}\cot^{-1}(x)^2 - \frac{1}{2}\log\left(1+x^2\right) + \frac{1}{6}\operatorname{Subst}\left(\int \left(1+\frac{1}{-1-x}\right)dx, x, x^2\right) \\
&= \frac{x^2}{6} - x \cot^{-1}(x) + \frac{1}{3}x^3 \cot^{-1}(x) - \frac{1}{2}\cot^{-1}(x)^2 - \frac{2}{3}\log\left(1+x^2\right)
\end{aligned}$$

Mathematica [A] time = 0.0274571, size = 32, normalized size = 0.8

$$\frac{1}{6}\left(x^2-4\log\left(x^2+1\right)+2\left(x^2-3\right)x\cot^{-1}(x)-3\cot^{-1}(x)^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcCot[x])/(1 + x^2),x]
```

```
[Out] (x^2 + 2*x*(-3 + x^2)*ArcCot[x] - 3*ArcCot[x]^2 - 4*Log[1 + x^2])/6
```

Maple [A] time = 0.029, size = 38, normalized size = 1.

$$\frac{x^3\mathrm{arccot}\,(x)}{3}-x\mathrm{arccot}\,(x)+\mathrm{arccot}\,(x)\arctan\,(x)+\frac{x^2}{6}-\frac{2\,\ln\left(x^2+1\right)}{3}+\frac{(\arctan\,(x))^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arccot(x)/(x^2+1),x)
```

```
[Out] 1/3*x^3*arccot(x)-x*arccot(x)+arccot(x)*arctan(x)+1/6*x^2-2/3*ln(x^2+1)+1/2
*arctan(x)^2
```

Maxima [A] time = 1.47917, size = 47, normalized size = 1.18

$$\frac{1}{6}x^2+\frac{1}{3}\left(x^3-3x+3\arctan\,(x)\right)\mathrm{arccot}\,(x)+\frac{1}{2}\arctan\,(x)^2-\frac{2}{3}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] 1/6*x^2 + 1/3*(x^3 - 3*x + 3*arctan(x))*arccot(x) + 1/2*arctan(x)^2 - 2/3*l
og(x^2 + 1)
```

Fricas [A] time = 1.99925, size = 100, normalized size = 2.5

$$\frac{1}{6}x^2+\frac{1}{3}\left(x^3-3x\right)\mathrm{arccot}\,(x)-\frac{1}{2}\mathrm{arccot}\,(x)^2-\frac{2}{3}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] 1/6*x^2 + 1/3*(x^3 - 3*x)*arccot(x) - 1/2*arccot(x)^2 - 2/3*log(x^2 + 1)
```

Sympy [A] time = 0.710818, size = 34, normalized size = 0.85

$$\frac{x^3\operatorname{acot}(x)}{3}+\frac{x^2}{6}-x\operatorname{acot}(x)-\frac{2\log\left(x^2+1\right)}{3}-\frac{\operatorname{acot}^2(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*acot(x)/(x**2+1),x)
```

```
[Out] x**3*acot(x)/3 + x**2/6 - x*acot(x) - 2*log(x**2 + 1)/3 - acot(x)**2/2
```

Giac [B] time = 1.13736, size = 90, normalized size = 2.25

$$\frac{1}{6}\,ix^3\log\left(-\frac{i-x}{i+x}\right)-\frac{1}{2}\,ix\log\left(-\frac{i-x}{i+x}\right)+\frac{1}{6}\,x^2+\frac{1}{8}\,\log\left(-\frac{i-x}{i+x}\right)^2-\frac{2}{3}\,\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] 1/6*i*x^3*log(-(i - x)/(i + x)) - 1/2*i*x*log(-(i - x)/(i + x)) + 1/6*x^2 +
 1/8*log(-(i - x)/(i + x))^2 - 2/3*log(x^2 + 1)
```

3.38 $\int \frac{x^3 \cot^{-1}(x)}{1+x^2} \, dx$

Optimal. Leaf size=67

$$-\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1+ix}\right)+\frac{1}{2}x^2\cot^{-1}(x)+\frac{x}{2}-\frac{1}{2}\tan^{-1}(x)-\frac{1}{2}i\cot^{-1}(x)^2+\log\left(\frac{2}{1+ix}\right)\cot^{-1}(x)$$

```
[Out] x/2 + (x^2*ArcCot[x])/2 - (I/2)*ArcCot[x]^2 - ArcTan[x]/2 + ArcCot[x]*Log[2
/(1 + I*x)] - (I/2)*PolyLog[2, 1 - 2/(1 + I*x)]
```

Rubi [A] time = 0.0926004, antiderivative size = 67, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615, Rules used = {4917, 4853, 321, 203, 4921, 4855, 2402, 2315}

$$-\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1+ix}\right)+\frac{1}{2}x^2\cot^{-1}(x)+\frac{x}{2}-\frac{1}{2}\tan^{-1}(x)-\frac{1}{2}i\cot^{-1}(x)^2+\log\left(\frac{2}{1+ix}\right)\cot^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcCot[x])/(1 + x^2),x]
```


```
[Out] x/2 + (x^2*ArcCot[x])/2 - (I/2)*ArcCot[x]^2 - ArcTan[x]/2 + ArcCot[x]*Log[2
/(1 + I*x)] - (I/2)*PolyLog[2, 1 - 2/(1 + I*x)]
```


Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{x^3 \cot^{-1}(x)}{1+x^2} dx = \int x \cot^{-1}(x) dx - \int \frac{x \cot^{-1}(x)}{1+x^2} dx$$
$$= \frac{1}{2}x^2 \cot^{-1}(x) - \frac{1}{2}i \cot^{-1}(x)^2 + \frac{1}{2}\int \frac{x^2}{1+x^2} dx + \int \frac{\cot^{-1}(x)}{i-x} dx$$
$$= \frac{x}{2} + \frac{1}{2}x^2 \cot^{-1}(x) - \frac{1}{2}i \cot^{-1}(x)^2 + \cot^{-1}(x) \log\left(\frac{2}{1+ix}\right) - \frac{1}{2}\int \frac{1}{1+x^2} dx + \int \frac{\log\left(\frac{2}{1+ix}\right)}{1+x^2} dx$$
$$= \frac{x}{2} + \frac{1}{2}x^2 \cot^{-1}(x) - \frac{1}{2}i \cot^{-1}(x)^2 - \frac{1}{2}\tan^{-1}(x) + \cot^{-1}(x) \log\left(\frac{2}{1+ix}\right) - i\,\mathrm{Subst}\left(\int \frac{\log(2x)}{1-2x} dx, x, \frac{1}{1}\right.$$
$$= \frac{x}{2} + \frac{1}{2}x^2 \cot^{-1}(x) - \frac{1}{2}i \cot^{-1}(x)^2 - \frac{1}{2}\tan^{-1}(x) + \cot^{-1}(x) \log\left(\frac{2}{1+ix}\right) - \frac{1}{2}i\mathrm{Li}_2\left(1 - \frac{2}{1+ix}\right)$$

Mathematica [B] time = 0.0590699, size = 241, normalized size = 3.6

$$-\frac{1}{4}i\mathrm{PolyLog}\left(2, -\frac{1}{2}i(-x+i)\right) + \frac{1}{4}i\mathrm{PolyLog}\left(2, -\frac{1}{2}i(x+i)\right) + \frac{1}{2}x^2 \cot^{-1}(x) + \frac{x}{2} + \frac{1}{8}i \log^2(-x+i) - \frac{1}{8}i \log^2(x+i) - \frac{1}{4}i \mathrm{l}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcCot[x])/(1 + x^2),x]
```

```
[Out] x/2 + (x^2*ArcCot[x])/2 - ArcTan[x]/2 + (I/8)*Log[I - x]^2 - (I/4)*Log[I -
x]*Log[-((I - x)/x)] - (I/4)*Log[I - x]*Log[(-I/2)*(I + x)] + (I/4)*Log[(-I
/2)*(I - x)]*Log[I + x] - (I/4)*Log[-((I - x)/x)]*Log[I + x] - (I/8)*Log[I
+ x]^2 + (I/4)*Log[I - x]*Log[(I + x)/x] + (I/4)*Log[I + x]*Log[(I + x)/x]
- (I/4)*PolyLog[2, (-I/2)*(I - x)] + (I/4)*PolyLog[2, (-I/2)*(I + x)]
```

Maple [B] time = 0.114, size = 128, normalized size = 1.9

$$\frac{x^2 \mathrm{arccot}\,(x)}{2} - \frac{\mathrm{arccot}\,(x) \ln\left(x^2+1\right)}{2} + \frac{x}{2} - \frac{\arctan(x)}{2} - \frac{i}{8}\left(\ln(x-i)\right)^2 - \frac{i}{4}\ln(x-i)\ln\left(-\frac{i}{2}(x+i)\right) + \frac{i}{4}\ln(x-i)\ln\left(x^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(x)/(x^2+1),x)
```

```
[Out] 1/2*x^2*arccot(x)-1/2*arccot(x)*ln(x^2+1)+1/2*x-1/2*arctan(x)-1/8*I*ln(x-I)
^2-1/4*I*ln(x-I)*ln(-1/2*I*(x+I))+1/4*I*ln(x-I)*ln(x^2+1)-1/4*I*dilog(-1/2*
```

```
I*(x+I))+1/8*I*ln(x+I)^2+1/4*I*ln(x+I)*ln(1/2*I*(x-I))-1/4*I*ln(x+I)*ln(x^2
+1)+1/4*I*dilog(1/2*I*(x-I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 \operatorname{arccot}(x)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arccot(x)/(x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^3 \operatorname{arccot}(x)}{x^2+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(x^3*arccot(x)/(x^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 \operatorname{acot}(x)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(x)/(x**2+1),x)
```

```
[Out] Integral(x**3*acot(x)/(x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 \operatorname{arccot}(x)}{x^2 + 1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(x^3*arccot(x)/(x^2 + 1), x)
```

3.39 $\int \frac{x^2 \cot^{-1}(x)}{1+x^2} \, dx$

Optimal. Leaf size=23

$$\frac{1}{2}\log\left(x^2+1\right)+\frac{1}{2}\cot^{-1}(x)^2+x\cot^{-1}(x)$$

```
[Out] x*ArcCot[x] + ArcCot[x]^2/2 + Log[1 + x^2]/2
```

Rubi [A] time = 0.0481948, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {4917, 4847, 260, 4885}

$$\frac{1}{2}\log\left(x^2+1\right)+\frac{1}{2}\cot^{-1}(x)^2+x\cot^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcCot[x])/(1 + x^2),x]
```

```
[Out] x*ArcCot[x] + ArcCot[x]^2/2 + Log[1 + x^2]/2
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2 \cot^{-1}(x)}{1+x^2}\,dx &= \int \cot^{-1}(x)\,dx - \int \frac{\cot^{-1}(x)}{1+x^2}\,dx \\
&= x\cot^{-1}(x) + \frac{1}{2}\cot^{-1}(x)^2 + \int \frac{x}{1+x^2}\,dx \\
&= x\cot^{-1}(x) + \frac{1}{2}\cot^{-1}(x)^2 + \frac{1}{2}\log\left(1+x^2\right)
\end{aligned}$$

Mathematica [A] time = 0.0133661, size = 23, normalized size = 1.

$$\frac{1}{2}\log\left(x^2+1\right) + \frac{1}{2}\cot^{-1}(x)^2 + x\cot^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcCot[x])/(1 + x^2),x]
```

```
[Out] x*ArcCot[x] + ArcCot[x]^2/2 + Log[1 + x^2]/2
```

Maple [A] time = 0.03, size = 26, normalized size = 1.1

$$-\text{arccot}\,(x)\arctan(x) + x\text{arccot}\,(x) + \frac{\ln\left(x^2+1\right)}{2} - \frac{(\arctan(x))^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(x)/(x^2+1),x)
```

```
[Out] -arccot(x)*arctan(x)+x*arccot(x)+1/2*ln(x^2+1)-1/2*arctan(x)^2
```

Maxima [A] time = 1.54104, size = 32, normalized size = 1.39

$$(x - \arctan(x))\,\text{arccot}\,(x) - \frac{1}{2}\arctan(x)^2 + \frac{1}{2}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] (x - arctan(x))*arccot(x) - 1/2*arctan(x)^2 + 1/2*log(x^2 + 1)
```

Fricas [A] time = 1.86692, size = 68, normalized size = 2.96

$$x \operatorname{arccot}(x) + \frac{1}{2} \operatorname{arccot}(x)^2 + \frac{1}{2} \log\left(x^2 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] x*arccot(x) + 1/2*arccot(x)^2 + 1/2*log(x^2 + 1)
```

Sympy [A] time = 0.38859, size = 19, normalized size = 0.83

$$x \operatorname{acot}(x) + \frac{\log\left(x^2 + 1\right)}{2} + \frac{\operatorname{acot}^2(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(x)/(x**2+1),x)
```

```
[Out] x*acot(x) + log(x**2 + 1)/2 + acot(x)**2/2
```

Giac [B] time = 1.1239, size = 58, normalized size = 2.52

$$\frac{1}{2} ix \log\left(-\frac{i - x}{i + x}\right) - \frac{1}{8} \log\left(-\frac{i - x}{i + x}\right)^2 + \frac{1}{2} \log\left(x^2 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] 1/2*i*x*log(-(i - x)/(i + x)) - 1/8*log(-(i - x)/(i + x))^2 + 1/2*log(x^2 +
 1)
```

3.40 $\int \frac{x\cot^{-1}(x)}{1+x^2}\,dx$

Optimal. Leaf size=48

$$\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1+ix}\right)+\frac{1}{2}i\cot^{-1}(x)^2-\log\left(\frac{2}{1+ix}\right)\cot^{-1}(x)$$

```
[Out] (I/2)*ArcCot[x]^2 - ArcCot[x]*Log[2/(1 + I*x)] + (I/2)*PolyLog[2, 1 - 2/(1
+ I*x)]
```

Rubi [A] time = 0.0540192, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4921, 4855, 2402, 2315}

$$\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1+ix}\right)+\frac{1}{2}i\cot^{-1}(x)^2-\log\left(\frac{2}{1+ix}\right)\cot^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcCot[x])/(1 + x^2),x]
```

```
[Out] (I/2)*ArcCot[x]^2 - ArcCot[x]*Log[2/(1 + I*x)] + (I/2)*PolyLog[2, 1 - 2/(1
+ I*x)]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x\cot^{-1}(x)}{1+x^2}\,dx &= \frac{1}{2}i\cot^{-1}(x)^2-\int \frac{\cot^{-1}(x)}{i-x}\,dx\\ &= \frac{1}{2}i\cot^{-1}(x)^2-\cot^{-1}(x)\log\left(\frac{2}{1+ix}\right)-\int \frac{\log\left(\frac{2}{1+ix}\right)}{1+x^2}\,dx\\ &= \frac{1}{2}i\cot^{-1}(x)^2-\cot^{-1}(x)\log\left(\frac{2}{1+ix}\right)+i\,\text{Subst}\left(\int \frac{\log(2x)}{1-2x}\,dx,x,\frac{1}{1+ix}\right)\\ &= \frac{1}{2}i\cot^{-1}(x)^2-\cot^{-1}(x)\log\left(\frac{2}{1+ix}\right)+\frac{1}{2}i\text{Li}_2\left(1-\frac{2}{1+ix}\right)\end{aligned}$$

Mathematica [B] time = 0.0472643, size = 221, normalized size = 4.6

$$\frac{1}{4}i\text{PolyLog}\left(2,-\frac{1}{2}i(-x+i)\right)-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{1}{2}i(x+i)\right)-\frac{1}{8}i\log^2(-x+i)+\frac{1}{8}i\log^2(x+i)+\frac{1}{4}i\log\left(-\frac{-x+i}{x}\right)\log(-x$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcCot[x])/(1 + x^2),x]
```

```
[Out] (-I/8)*Log[I - x]^2 + (I/4)*Log[I - x]*Log[-((I - x)/x)] + (I/4)*Log[I - x]
*Log[(-I/2)*(I + x)] - (I/4)*Log[(-I/2)*(I - x)]*Log[I + x] + (I/4)*Log[-((
I - x)/x)]*Log[I + x] + (I/8)*Log[I + x]^2 - (I/4)*Log[I - x]*Log[(I + x)/x
] - (I/4)*Log[I + x]*Log[(I + x)/x] + (I/4)*PolyLog[2, (-I/2)*(I - x)] - (I
/4)*PolyLog[2, (-I/2)*(I + x)]
```

Maple [B] time = 0.104, size = 114, normalized size = 2.4

$$\frac{\text{arccot}(x)\ln\left(x^2+1\right)}{2}-\frac{i}{4}\ln(x-i)\ln\left(x^2+1\right)+\frac{i}{8}(\ln(x-i))^2+\frac{i}{4}\ln(x-i)\ln\left(-\frac{i}{2}(x+i)\right)+\frac{i}{4}\text{dilog}\left(-\frac{i}{2}(x+i)\right)+\frac{i}{4}\text{l}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(x)/(x^2+1),x)
```

```
[Out] 1/2*arccot(x)*ln(x^2+1)-1/4*I*ln(x-I)*ln(x^2+1)+1/8*I*ln(x-I)^2+1/4*I*ln(x-
I)*ln(-1/2*I*(x+I))+1/4*I*dilog(-1/2*I*(x+I))+1/4*I*ln(x+I)*ln(x^2+1)-1/8*I
*ln(x+I)^2-1/4*I*ln(x+I)*ln(1/2*I*(x-I))-1/4*I*dilog(1/2*I*(x-I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \operatorname{arccot}(x)}{x^2+1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] integrate(x*arccot(x)/(x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x \operatorname{arccot}(x)}{x^2+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(x*arccot(x)/(x^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \operatorname{acot}(x)}{x^2+1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(x)/(x**2+1),x)
```

```
[Out] Integral(x*acot(x)/(x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \operatorname{arccot}(x)}{x^2+1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(x)/(x^2 + 1), x)
```

3.41 $\int \frac{\cot^{-1}(x)}{1+x^2}\,dx$

Optimal. Leaf size=8

$$-\frac{1}{2}\cot^{-1}(x)^2$$

```
[Out] -ArcCot[x]^2/2
```

Rubi [A] time = 0.0115701, antiderivative size = 8, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {4885}

$$-\frac{1}{2}\cot^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(1 + x^2),x]
```

```
[Out] -ArcCot[x]^2/2
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{1+x^2}\,dx=-\frac{1}{2}\cot^{-1}(x)^2$$

Mathematica [A] time = 0.0031552, size = 8, normalized size = 1.

$$-\frac{1}{2}\cot^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(1 + x^2),x]
```

```
[Out] -ArcCot[x]^2/2
```

Maple [A] time = 0.02, size = 7, normalized size = 0.9

$$-\frac{(\operatorname{arccot}(x))^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/(x^2+1),x)
```

```
[Out] -1/2*arccot(x)^2
```

Maxima [A] time = 0.977856, size = 8, normalized size = 1.

$$-\frac{1}{2}\operatorname{arccot}(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] -1/2*arccot(x)^2
```

Fricas [A] time = 1.92167, size = 24, normalized size = 3.

$$-\frac{1}{2}\operatorname{arccot}(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] -1/2*arccot(x)^2
```

Sympy [A] time = 0.695324, size = 7, normalized size = 0.88

$$-\frac{\operatorname{acot}^2(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/(x**2+1),x)
```

```
[Out] -acot(x)**2/2
```

Giac [A] time = 1.10768, size = 11, normalized size = 1.38

$$-\frac{1}{2} \arctan\left(\frac{1}{x}\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] -1/2*arctan(1/x)^2
```

3.42 $\int \frac{\cot^{-1}(x)}{x(1+x^2)} dx$

Optimal. Leaf size=49

$$\frac{1}{2} i \text{PolyLog}\left(2,-1+\frac{2}{1-ix}\right)+\frac{1}{2} i \cot^{-1}(x)^2+\log\left(2-\frac{2}{1-ix}\right)\cot^{-1}(x)$$

```
[Out] (I/2)*ArcCot[x]^2 + ArcCot[x]*Log[2 - 2/(1 - I*x)] + (I/2)*PolyLog[2, -1 +
2/(1 - I*x)]
```

Rubi [A] time = 0.0729478, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {4925, 4869, 2447}

$$\frac{1}{2} i \text{PolyLog}\left(2,-1+\frac{2}{1-ix}\right)+\frac{1}{2} i \cot^{-1}(x)^2+\log\left(2-\frac{2}{1-ix}\right)\cot^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(x*(1 + x^2)),x]
```

```
[Out] (I/2)*ArcCot[x]^2 + ArcCot[x]*Log[2 - 2/(1 - I*x)] + (I/2)*PolyLog[2, -1 +
2/(1 - I*x)]
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}(x)}{x\left(1+x^2\right)}\,dx &= \frac{1}{2}i\cot^{-1}(x)^2 + i\int \frac{\cot^{-1}(x)}{x(i+x)}\,dx\\ &= \frac{1}{2}i\cot^{-1}(x)^2 + \cot^{-1}(x)\log\left(2-\frac{2}{1-ix}\right) + \int \frac{\log\left(2-\frac{2}{1-ix}\right)}{1+x^2}\,dx\\ &= \frac{1}{2}i\cot^{-1}(x)^2 + \cot^{-1}(x)\log\left(2-\frac{2}{1-ix}\right) + \frac{1}{2}i\text{Li}_2\left(-1+\frac{2}{1-ix}\right)\end{aligned}$$

Mathematica [B] time = 0.0596438, size = 251, normalized size = 5.12

$$-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{1}{2}i(-x+i)\right)-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{x}\right)+\frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{x}\right)+\frac{1}{4}i\text{PolyLog}\left(2,-\frac{1}{2}i(x+i)\right)+\frac{1}{8}i\log^2(-x+$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[x]/(x*(1 + x^2)),x]
```

```
[Out] (I/8)*Log[I - x]^2 - (I/4)*Log[I - x]*Log[-((I - x)/x)] - (I/4)*Log[I - x]*
Log[(-I/2)*(I + x)] + (I/4)*Log[(-I/2)*(I - x)]*Log[I + x] - (I/4)*Log[-((I
 - x)/x)]*Log[I + x] - (I/8)*Log[I + x]^2 + (I/4)*Log[I - x]*Log[(I + x)/x]
 + (I/4)*Log[I + x]*Log[(I + x)/x] - (I/4)*PolyLog[2, (-I/2)*(I - x)] - (I/
2)*PolyLog[2, (-I)/x] + (I/2)*PolyLog[2, I/x] + (I/4)*PolyLog[2, (-I/2)*(I
+ x)]
```

Maple [B] time = 0.115, size = 163, normalized size = 3.3

$$-\frac{\text{arccot}\,(x)\ln\left(x^2+1\right)}{2}+\text{arccot}\,(x)\ln(x)-\frac{i}{2}\ln(x)\ln(1+ix)+\frac{i}{2}\ln(x)\ln(1-ix)-\frac{i}{2}\text{dilog}\,(1+ix)+\frac{i}{2}\text{dilog}\,(1-ix$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/x/(x^2+1),x)
```

```
[Out] -1/2*arccot(x)*ln(x^2+1)+arccot(x)*ln(x)-1/2*I*ln(x)*ln(1+I*x)+1/2*I*ln(x)*
ln(1-I*x)-1/2*I*dilog(1+I*x)+1/2*I*dilog(1-I*x)-1/8*I*ln(x-I)^2-1/4*I*ln(x-
I)*ln(-1/2*I*(x+I))+1/4*I*ln(x-I)*ln(x^2+1)-1/4*I*dilog(-1/2*I*(x+I))+1/8*I
*ln(x+I)^2+1/4*I*ln(x+I)*ln(1/2*I*(x-I))-1/4*I*ln(x+I)*ln(x^2+1)+1/4*I*dilo
g(1/2*I*(x-I))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{(x^2+1)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x/(x^2+1),x, algorithm="maxima")
```

```
[Out] integrate(arccot(x)/((x^2 + 1)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(x)}{x^3+x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(arccot(x)/(x^3 + x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(x)}{x(x^2+1)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/x/(x**2+1),x)
```

```
[Out] Integral(acot(x)/(x*(x**2 + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{(x^2+1)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(x)/((x^2 + 1)*x), x)
```

3.43 $\int \frac{\cot^{-1}(x)}{x^2(1+x^2)}\,dx$

Optimal. Leaf size=30

$$\frac{1}{2}\log\left(x^2+1\right)-\log(x)+\frac{1}{2}\cot^{-1}(x)^2-\frac{\cot^{-1}(x)}{x}$$

```
[Out] -(ArcCot[x]/x) + ArcCot[x]^2/2 - Log[x] + Log[1 + x^2]/2
```

Rubi [A] time = 0.0557802, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538, Rules used = {4919, 4853, 266, 36, 29, 31, 4885}

$$\frac{1}{2}\log\left(x^2+1\right)-\log(x)+\frac{1}{2}\cot^{-1}(x)^2-\frac{\cot^{-1}(x)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(x^2*(1 + x^2)),x]
```

```
[Out] -(ArcCot[x]/x) + ArcCot[x]^2/2 - Log[x] + Log[1 + x^2]/2
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}(x)}{x^2\left(1+x^2\right)}\,dx &= \int \frac{\cot^{-1}(x)}{x^2}\,dx-\int \frac{\cot^{-1}(x)}{1+x^2}\,dx\\ &= -\frac{\cot^{-1}(x)}{x}+\frac{1}{2}\cot^{-1}(x)^2-\int \frac{1}{x\left(1+x^2\right)}\,dx\\ &= -\frac{\cot^{-1}(x)}{x}+\frac{1}{2}\cot^{-1}(x)^2-\frac{1}{2}\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx,x,x^2\right)\\ &= -\frac{\cot^{-1}(x)}{x}+\frac{1}{2}\cot^{-1}(x)^2-\frac{1}{2}\text{Subst}\left(\int \frac{1}{x}\,dx,x,x^2\right)+\frac{1}{2}\text{Subst}\left(\int \frac{1}{1+x}\,dx,x,x^2\right)\\ &= -\frac{\cot^{-1}(x)}{x}+\frac{1}{2}\cot^{-1}(x)^2-\log(x)+\frac{1}{2}\log\left(1+x^2\right)\end{aligned}$$

Mathematica [A] time = 0.0158508, size = 30, normalized size = 1.

$$\frac{1}{2}\log\left(x^2+1\right)-\log(x)+\frac{1}{2}\cot^{-1}(x)^2-\frac{\cot^{-1}(x)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(x^2*(1 + x^2)),x]
```

```
[Out] -(ArcCot[x]/x) + ArcCot[x]^2/2 - Log[x] + Log[1 + x^2]/2
```

Maple [A] time = 0.033, size = 33, normalized size = 1.1

$$-\operatorname{arccot}(x)\arctan(x) - \frac{\operatorname{arccot}(x)}{x} + \frac{\ln\left(x^2+1\right)}{2} - \ln(x) - \frac{(\arctan(x))^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/x^2/(x^2+1),x)
```

```
[Out] -arccot(x)*arctan(x)-arccot(x)/x+1/2*ln(x^2+1)-ln(x)-1/2*arctan(x)^2
```

Maxima [A] time = 1.50688, size = 39, normalized size = 1.3

$$-\left(\frac{1}{x} + \arctan(x)\right)\operatorname{arccot}(x) - \frac{1}{2}\arctan(x)^2 + \frac{1}{2}\log\left(x^2+1\right) - \log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^2/(x^2+1),x, algorithm="maxima")
```

```
[Out] -(1/x + arctan(x))*arccot(x) - 1/2*arctan(x)^2 + 1/2*log(x^2 + 1) - log(x)
```

Fricas [A] time = 1.94416, size = 90, normalized size = 3.

$$\frac{x\operatorname{arccot}(x)^2 + x\log\left(x^2+1\right) - 2x\log(x) - 2\operatorname{arccot}(x)}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^2/(x^2+1),x, algorithm="fricas")
```

```
[Out] 1/2*(x*arccot(x)^2 + x*log(x^2 + 1) - 2*x*log(x) - 2*arccot(x))/x
```

Sympy [A] time = 0.654051, size = 22, normalized size = 0.73

$$-\log(x) + \frac{\log\left(x^2+1\right)}{2} + \frac{\operatorname{acot}^2(x)}{2} - \frac{\operatorname{acot}(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/x**2/(x**2+1),x)
```

```
[Out] -log(x) + log(x**2 + 1)/2 + acot(x)**2/2 - acot(x)/x
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{\left(x^2+1\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^2/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(x)/((x^2 + 1)*x^2), x)
```

3.44 $\int \frac{\cot^{-1}(x)}{x^3(1+x^2)}\,dx$

Optimal. Leaf size=72

$$-\frac{1}{2}i\text{PolyLog}\left(2,-1+\frac{2}{1-ix}\right)-\frac{\cot^{-1}(x)}{2x^2}+\frac{1}{2x}+\frac{1}{2}\tan^{-1}(x)-\frac{1}{2}i\cot^{-1}(x)^2-\log\left(2-\frac{2}{1-ix}\right)\cot^{-1}(x)$$

```
[Out] 1/(2*x) - ArcCot[x]/(2*x^2) - (I/2)*ArcCot[x]^2 + ArcTan[x]/2 - ArcCot[x]*L
og[2 - 2/(1 - I*x)] - (I/2)*PolyLog[2, -1 + 2/(1 - I*x)]
```

Rubi [A] time = 0.114667, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538, Rules used = {4919, 4853, 325, 203, 4925, 4869, 2447}

$$-\frac{1}{2}i\text{PolyLog}\left(2,-1+\frac{2}{1-ix}\right)-\frac{\cot^{-1}(x)}{2x^2}+\frac{1}{2x}+\frac{1}{2}\tan^{-1}(x)-\frac{1}{2}i\cot^{-1}(x)^2-\log\left(2-\frac{2}{1-ix}\right)\cot^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(x^3*(1 + x^2)),x]
```

```
[Out] 1/(2*x) - ArcCot[x]/(2*x^2) - (I/2)*ArcCot[x]^2 + ArcTan[x]/2 - ArcCot[x]*L
og[2 - 2/(1 - I*x)] - (I/2)*PolyLog[2, -1 + 2/(1 - I*x)]
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4925

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist[
I/d, Int[(a + b*ArcCot[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4869

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcCot[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] + Di
st[(b*c*p)/d, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{x^3\left(1+x^2\right)}\,dx = \int \frac{\cot^{-1}(x)}{x^3}\,dx - \int \frac{\cot^{-1}(x)}{x\left(1+x^2\right)}\,dx$$
$$= -\frac{\cot^{-1}(x)}{2x^2} - \frac{1}{2}i\cot^{-1}(x)^2 - i\int \frac{\cot^{-1}(x)}{x(i+x)}\,dx - \frac{1}{2}\int \frac{1}{x^2\left(1+x^2\right)}\,dx$$
$$= \frac{1}{2x} - \frac{\cot^{-1}(x)}{2x^2} - \frac{1}{2}i\cot^{-1}(x)^2 - \cot^{-1}(x)\log\left(2-\frac{2}{1-ix}\right) + \frac{1}{2}\int \frac{1}{1+x^2}\,dx - \int \frac{\log\left(2-\frac{2}{1-ix}\right)}{1+x^2}\,dx$$
$$= \frac{1}{2x} - \frac{\cot^{-1}(x)}{2x^2} - \frac{1}{2}i\cot^{-1}(x)^2 + \frac{1}{2}\tan^{-1}(x) - \cot^{-1}(x)\log\left(2-\frac{2}{1-ix}\right) - \frac{1}{2}i\text{Li}_2\left(-1+\frac{2}{1-ix}\right)$$

Mathematica [C] time = 0.06297, size = 280, normalized size = 3.89

$$\frac{1}{4}i\text{PolyLog}\left(2,-\frac{1}{2}i(-x+i)\right) + \frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{x}\right) - \frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{x}\right) - \frac{1}{4}i\text{PolyLog}\left(2,-\frac{1}{2}i(x+i)\right) + \frac{{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-\right.}{2x}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[x]/(x^3*(1 + x^2)),x]
```

```
[Out] -ArcCot[x]/(2*x^2) + Hypergeometric2F1[-1/2, 1, 1/2, -x^2]/(2*x) - (I/8)*Lo
g[I - x]^2 + (I/4)*Log[I - x]*Log[-((I - x)/x)] + (I/4)*Log[I - x]*Log[(-I/
2)*(I + x)] - (I/4)*Log[(-I/2)*(I - x)]*Log[I + x] + (I/4)*Log[-((I - x)/x)
]*Log[I + x] + (I/8)*Log[I + x]^2 - (I/4)*Log[I - x]*Log[(I + x)/x] - (I/4)
*Log[I + x]*Log[(I + x)/x] + (I/4)*PolyLog[2, (-I/2)*(I - x)] + (I/2)*PolyL
og[2, (-I)/x] - (I/2)*PolyLog[2, I/x] - (I/4)*PolyLog[2, (-I/2)*(I + x)]
```

Maple [B] time = 0.115, size = 180, normalized size = 2.5

$$\frac{\text{arccot}(x)\ln\left(x^2+1\right)}{2} - \frac{\text{arccot}(x)}{2\,x^2} - \text{arccot}(x)\ln(x) - \frac{i}{8}\left(\ln(x+i)\right)^2 + \frac{i}{4}\ln(x+i)\ln\left(x^2+1\right) - \frac{i}{2}\text{dilog}(1-ix) + \frac{i}{2}\text{dil}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/x^3/(x^2+1),x)
```

```
[Out] 1/2*arccot(x)*ln(x^2+1)-1/2*arccot(x)/x^2-arccot(x)*ln(x)-1/8*I*ln(x+I)^2+1
/4*I*ln(x+I)*ln(x^2+1)-1/2*I*dilog(1-I*x)+1/2*I*dilog(1+I*x)+1/4*I*ln(x-I)*
```

```
ln(-1/2*I*(x+I))-1/4*I*ln(x-I)*ln(x^2+1)+1/4*I*dilog(-1/2*I*(x+I))+1/8*I*ln
(x-I)^2+1/2*arctan(x)+1/2/x-1/4*I*ln(x+I)*ln(1/2*I*(x-I))+1/2*I*ln(x)*ln(1+
I*x)-1/4*I*dilog(1/2*I*(x-I))-1/2*I*ln(x)*ln(1-I*x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{(x^2+1)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^3/(x^2+1),x, algorithm="maxima")
```

```
[Out] integrate(arccot(x)/((x^2 + 1)*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(x)}{x^5+x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^3/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(arccot(x)/(x^5 + x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(x)}{x^3(x^2+1)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/x**3/(x**2+1),x)
```

```
[Out] Integral(acot(x)/(x**3*(x**2 + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{(x^2+1)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^3/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(x)/((x^2 + 1)*x^3), x)
```

3.45 $\int \frac{\cot^{-1}(x)}{x^4(1+x^2)}\,dx$

Optimal. Leaf size=47

$$\frac{1}{6x^2}-\frac{2}{3}\log\left(x^2+1\right)-\frac{\cot^{-1}(x)}{3x^3}+\frac{4\log(x)}{3}-\frac{1}{2}\cot^{-1}(x)^2+\frac{\cot^{-1}(x)}{x}$$

```
[Out] 1/(6*x^2) - ArcCot[x]/(3*x^3) + ArcCot[x]/x - ArcCot[x]^2/2 + (4*Log[x])/3
- (2*Log[1 + x^2])/3
```

Rubi [A] time = 0.109391, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615, Rules used = {4919, 4853, 266, 44, 36, 29, 31, 4885}

$$\frac{1}{6x^2}-\frac{2}{3}\log\left(x^2+1\right)-\frac{\cot^{-1}(x)}{3x^3}+\frac{4\log(x)}{3}-\frac{1}{2}\cot^{-1}(x)^2+\frac{\cot^{-1}(x)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(x^4*(1 + x^2)),x]
```

```
[Out] 1/(6*x^2) - ArcCot[x]/(3*x^3) + ArcCot[x]/x - ArcCot[x]^2/2 + (4*Log[x])/3
- (2*Log[1 + x^2])/3
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{x^4\left(1+x^2\right)}\,dx = \int \frac{\cot^{-1}(x)}{x^4}\,dx - \int \frac{\cot^{-1}(x)}{x^2\left(1+x^2\right)}\,dx$$
$$= -\frac{\cot^{-1}(x)}{3x^3} - \frac{1}{3}\int \frac{1}{x^3\left(1+x^2\right)}\,dx - \int \frac{\cot^{-1}(x)}{x^2}\,dx + \int \frac{\cot^{-1}(x)}{1+x^2}\,dx$$
$$= -\frac{\cot^{-1}(x)}{3x^3} + \frac{\cot^{-1}(x)}{x} - \frac{1}{2}\cot^{-1}(x)^2 - \frac{1}{6}\,\text{Subst}\left(\int \frac{1}{x^2(1+x)}\,dx, x, x^2\right) + \int \frac{1}{x\left(1+x^2\right)}\,dx$$
$$= -\frac{\cot^{-1}(x)}{3x^3} + \frac{\cot^{-1}(x)}{x} - \frac{1}{2}\cot^{-1}(x)^2 - \frac{1}{6}\,\text{Subst}\left(\int \left(\frac{1}{x^2} - \frac{1}{x} + \frac{1}{1+x}\right)dx, x, x^2\right) + \frac{1}{2}\,\text{Subst}\left(\int \frac{}{x(1}\right.$$
$$= \frac{1}{6x^2} - \frac{\cot^{-1}(x)}{3x^3} + \frac{\cot^{-1}(x)}{x} - \frac{1}{2}\cot^{-1}(x)^2 + \frac{\log(x)}{3} - \frac{1}{6}\log\left(1+x^2\right) + \frac{1}{2}\,\text{Subst}\left(\int \frac{1}{x}\,dx, x, x^2\right) - \frac{1}{2}$$
$$= \frac{1}{6x^2} - \frac{\cot^{-1}(x)}{3x^3} + \frac{\cot^{-1}(x)}{x} - \frac{1}{2}\cot^{-1}(x)^2 + \frac{4\log(x)}{3} - \frac{2}{3}\log\left(1+x^2\right)$$

Mathematica [A] time = 0.0203647, size = 47, normalized size = 1.

$$\frac{1}{6x^2} - \frac{2}{3}\log\left(x^2+1\right) - \frac{\cot^{-1}(x)}{3x^3} + \frac{4\log(x)}{3} - \frac{1}{2}\cot^{-1}(x)^2 + \frac{\cot^{-1}(x)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(x^4*(1 + x^2)),x]
```

```
[Out] 1/(6*x^2) - ArcCot[x]/(3*x^3) + ArcCot[x]/x - ArcCot[x]^2/2 + (4*Log[x])/3
- (2*Log[1 + x^2])/3
```

Maple [A] time = 0.039, size = 43, normalized size = 0.9

$$\text{arccot}(x)\arctan(x) - \frac{\text{arccot}(x)}{3x^3} + \frac{\text{arccot}(x)}{x} - \frac{2\ln\left(x^2+1\right)}{3} + \frac{1}{6x^2} + \frac{4\ln(x)}{3} + \frac{(\arctan(x))^2}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/x^4/(x^2+1),x)
```

```
[Out] arccot(x)*arctan(x)-1/3*arccot(x)/x^3+arccot(x)/x-2/3*ln(x^2+1)+1/6/x^2+4/3
*ln(x)+1/2*arctan(x)^2
```

Maxima [A] time = 1.47906, size = 74, normalized size = 1.57

$$\frac{1}{3}\left(\frac{3\,x^{2}-1}{x^{3}}+3\,\arctan\left(x\right)\right)\operatorname{arccot}\left(x\right)+\frac{3\,x^{2}\arctan\left(x\right)^{2}-4\,x^{2}\log\left(x^{2}+1\right)+8\,x^{2}\log\left(x\right)+1}{6\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^4/(x^2+1),x, algorithm="maxima")
```

```
[Out] 1/3*((3*x^2 - 1)/x^3 + 3*arctan(x))*arccot(x) + 1/6*(3*x^2*arctan(x)^2 - 4*
x^2*log(x^2 + 1) + 8*x^2*log(x) + 1)/x^2
```

Fricas [A] time = 1.95685, size = 130, normalized size = 2.77

$$-\frac{3\,x^{3}\operatorname{arccot}\left(x\right)^{2}+4\,x^{3}\log\left(x^{2}+1\right)-8\,x^{3}\log\left(x\right)-2\left(3\,x^{2}-1\right)\operatorname{arccot}\left(x\right)-x}{6\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^4/(x^2+1),x, algorithm="fricas")
```

```
[Out] -1/6*(3*x^3*arccot(x)^2 + 4*x^3*log(x^2 + 1) - 8*x^3*log(x) - 2*(3*x^2 - 1)
*arccot(x) - x)/x^3
```

Sympy [A] time = 1.87486, size = 42, normalized size = 0.89

$$\frac{4\log\left(x\right)}{3}-\frac{2\log\left(x^{2}+1\right)}{3}-\frac{\operatorname{acot}^{2}\left(x\right)}{2}+\frac{\operatorname{acot}\left(x\right)}{x}+\frac{1}{6x^{2}}-\frac{\operatorname{acot}\left(x\right)}{3x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/x**4/(x**2+1),x)
```

```
[Out] 4*log(x)/3 - 2*log(x**2 + 1)/3 - acot(x)**2/2 + acot(x)/x + 1/(6*x**2) - ac
ot(x)/(3*x**3)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{(x^2+1)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/x^4/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(x)/((x^2 + 1)*x^4), x)
```

3.46 $\int \frac{x^2 \cot^{-1}(cx)}{1+x^2} \, dx$

Optimal. Leaf size=206

$$\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(-cx+i)}{(1-c)(1-ix)}\right)-\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(cx+i)}{(c+1)(1-ix)}\right)+\frac{\log\left(c^2x^2+1\right)}{2c}+x\cot^{-1}(cx)-\frac{1}{2}i\tan^{-1}(x)\log$$

```
[Out] x*ArcCot[c*x] - (I/2)*ArcTan[x]*Log[1 - I/(c*x)] + (I/2)*ArcTan[x]*Log[1 +
I/(c*x)] + (I/2)*ArcTan[x]*Log[((-2*I)*(I - c*x))/((1 - c)*(1 - I*x))] - (I
/2)*ArcTan[x]*Log[((-2*I)*(I + c*x))/((1 + c)*(1 - I*x))] + Log[1 + c^2*x^2
]/(2*c) + PolyLog[2, 1 + ((2*I)*(I - c*x))/((1 - c)*(1 - I*x))]/4 - PolyLog
[2, 1 + ((2*I)*(I + c*x))/((1 + c)*(1 - I*x))]/4
```

Rubi [A] time = 0.579502, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 15, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1., Rules used = {4917, 4847, 260, 4909, 203, 2470, 6688, 12, 4876, 4848, 2391, 4856, 2402, 2315, 2447}

$$\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(-cx+i)}{(1-c)(1-ix)}\right)-\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(cx+i)}{(c+1)(1-ix)}\right)+\frac{\log\left(c^2x^2+1\right)}{2c}+x\cot^{-1}(cx)-\frac{1}{2}i\tan^{-1}(x)\log$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcCot[c*x])/(1 + x^2),x]
```

```
[Out] x*ArcCot[c*x] - (I/2)*ArcTan[x]*Log[1 - I/(c*x)] + (I/2)*ArcTan[x]*Log[1 +
I/(c*x)] + (I/2)*ArcTan[x]*Log[((-2*I)*(I - c*x))/((1 - c)*(1 - I*x))] - (I
/2)*ArcTan[x]*Log[((-2*I)*(I + c*x))/((1 + c)*(1 - I*x))] + Log[1 + c^2*x^2
]/(2*c) + PolyLog[2, 1 + ((2*I)*(I - c*x))/((1 - c)*(1 - I*x))]/4 - PolyLog
[2, 1 + ((2*I)*(I + c*x))/((1 + c)*(1 - I*x))]/4
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4909

```
Int[ArcCot[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I/(c*x)]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I/(c*x)]/(d + e
*x^2), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2470

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))/((f_) + (g_.)
*(x_)^2), x_Symbol] :> With[{u = IntHide[1/(f + g*x^2), x]}, Simp[u*(a + b*
Log[c*(d + e*x^n)^p]), x] - Dist[b*e*n*p, Int[(u*x^(n - 1))/(d + e*x^n), x]
, x]] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && IntegerQ[n]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{x^2\cot^{-1}(cx)}{1+x^2}\,dx = \int \cot^{-1}(cx)\,dx - \int \frac{\cot^{-1}(cx)}{1+x^2}\,dx$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\int \frac{\log\left(1-\frac{i}{cx}\right)}{1+x^2}\,dx + \frac{1}{2}i\int \frac{\log\left(1+\frac{i}{cx}\right)}{1+x^2}\,dx + c\int \frac{x}{1+c^2x^2}\,dx$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\log\left(1+c^2x^2\right)}{2c} - \frac{\int \frac{\tan^{-1}(x)}{\left(1-\frac{i}{cx}\right)x^2}\,d}{2c}$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\log\left(1+c^2x^2\right)}{2c} - \frac{\int \frac{c\tan^{-1}(x)}{x(-i+cx)}\,c}{2c}$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\log\left(1+c^2x^2\right)}{2c} - \frac{1}{2}\int \frac{\tan^{-1}}{x(-i+}$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\log\left(1+c^2x^2\right)}{2c} - \frac{1}{2}\int\left(\frac{i\tan}{x}\right.$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\log\left(1+c^2x^2\right)}{2c} + \frac{1}{2}(ic)\int \frac{\tan}{-i}$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(-\frac{2i(i-cx}{(1-c)(1-}\right.$$

$$= x\cot^{-1}(cx) - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(-\frac{2i(i-cx}{(1-c)(1-}\right.$$

Mathematica [B] time = 1.58503, size = 626, normalized size = 3.04

$$\frac{1}{4}\sqrt{-c^2}\left(i\left(\text{PolyLog}\left(2,\frac{\left(c^2+2i\sqrt{-c^2}+1\right)\left(\sqrt{-c^2}+cx\right)}{\left(c^2-1\right)\left(\sqrt{-c^2}-cx\right)}\right)-\text{PolyLog}\left(2,\frac{\left(c^2-2i\sqrt{-c^2}+1\right)\left(\sqrt{-c^2}+cx\right)}{\left(c^2-1\right)\left(\sqrt{-c^2}-cx\right)}\right)\right)+2\cos^{-1}\left(\frac{c^2+1}{c^2-1}\right)\tanh^{-1}\left(\frac{\sqrt{-c^2}}{cx}\right)-$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcCot[c*x])/(1 + x^2),x]
```

```
[Out] (c*x*ArcCot[c*x] - Log[1/(c*Sqrt[1 + 1/(c^2*x^2)]*x)] + (Sqrt[-c^2]*(2*ArcC
os[(1 + c^2)/(-1 + c^2)]*ArcTanh[Sqrt[-c^2]/(c*x)] - 4*ArcCot[c*x]*ArcTanh[
(c*x)/Sqrt[-c^2]] - (ArcCos[(1 + c^2)/(-1 + c^2)] - (2*I)*ArcTanh[Sqrt[-c^2
]/(c*x)])*Log[(-2*(c^2 + I*Sqrt[-c^2])*(-I + c*x))/((-1 + c^2)*(Sqrt[-c^2]
- c*x))] - (ArcCos[(1 + c^2)/(-1 + c^2)] + (2*I)*ArcTanh[Sqrt[-c^2]/(c*x)])
```

```
*Log[((2*I)*(I*c^2 + Sqrt[-c^2])*(I + c*x))/((-1 + c^2)*(Sqrt[-c^2] - c*x))
] + (ArcCos[(1 + c^2)/(-1 + c^2)] - (2*I)*ArcTanh[Sqrt[-c^2]/(c*x)] + (2*I)
*ArcTanh[(c*x)/Sqrt[-c^2]])*Log[(Sqrt[2]*Sqrt[-c^2])/(Sqrt[-1 + c^2]*E^(I*A
rcCot[c*x])*Sqrt[-1 - c^2 + (-1 + c^2)*Cos[2*ArcCot[c*x]]])] + (ArcCos[(1 +
 c^2)/(-1 + c^2)] + (2*I)*ArcTanh[Sqrt[-c^2]/(c*x)] - (2*I)*ArcTanh[(c*x)/S
qrt[-c^2]])*Log[(Sqrt[2]*Sqrt[-c^2]*E^(I*ArcCot[c*x]))/(Sqrt[-1 + c^2]*Sqrt
[-1 - c^2 + (-1 + c^2)*Cos[2*ArcCot[c*x]]])] + I*(-PolyLog[2, ((1 + c^2 - (
2*I)*Sqrt[-c^2])*(Sqrt[-c^2] + c*x))/((-1 + c^2)*(Sqrt[-c^2] - c*x))] + Pol
yLog[2, ((1 + c^2 + (2*I)*Sqrt[-c^2])*(Sqrt[-c^2] + c*x))/((-1 + c^2)*(Sqrt
[-c^2] - c*x))])))/4)/c
```

Maple [A] time = 0.247, size = 265, normalized size = 1.3

$$-\arctan(x)\operatorname{arccot}(cx) + x\operatorname{arccot}(cx) + \frac{\ln\left(c^2x^2+1\right)}{2c} + \frac{\frac{i}{2}c\arctan(x)}{-1+c}\ln\left(1-\frac{(1+c)(1+ix)^2}{\left(x^2+1\right)(-1+c)}\right) - \frac{\frac{i}{2}\arctan(x)}{-1+c}\ln\left(1-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c*x)/(x^2+1),x)
```

```
[Out] -arctan(x)*arccot(c*x)+x*arccot(c*x)+1/2*ln(c^2*x^2+1)/c+1/2*I*c/(-1+c)*ln(
1-(1+c)*(1+I*x)^2/(x^2+1)/(-1+c))*arctan(x)-1/2*I/(-1+c)*ln(1-(1+c)*(1+I*x)
^2/(x^2+1)/(-1+c))*arctan(x)+1/2*c/(-1+c)*arctan(x)^2+1/4*c/(-1+c)*polylog(
2,(1+c)*(1+I*x)^2/(x^2+1)/(-1+c))-1/2/(-1+c)*arctan(x)^2-1/4/(-1+c)*polylog
(2,(1+c)*(1+I*x)^2/(x^2+1)/(-1+c))-1/2*I*arctan(x)*ln(1-(-1+c)*(1+I*x)^2/(x
^2+1)/(1+c))-1/2*arctan(x)^2-1/4*polylog(2,(-1+c)*(1+I*x)^2/(x^2+1)/(1+c))
```

Maxima [A] time = 1.58836, size = 269, normalized size = 1.31

$$(x-\arctan(x))\operatorname{arccot}(cx) - \frac{4c\arctan(x)\arctan\left(\frac{cx}{c+1},\frac{1}{c+1}\right) - 4c\arctan(x)\arctan\left(\frac{cx}{c-1},-\frac{1}{c-1}\right) + c\log\left(x^2+1\right)\log\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c*x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] (x - arctan(x))*arccot(c*x) - 1/8*(4*c*arctan(x)*arctan2(c*x/(c + 1), 1/(c
+ 1)) - 4*c*arctan(x)*arctan2(c*x/(c - 1), -1/(c - 1)) + c*log(x^2 + 1)*log
```

```
((c^2*x^2 + 1)/(c^2 + 2*c + 1)) - c*log(x^2 + 1)*log((c^2*x^2 + 1)/(c^2 - 2
*c + 1)) + 2*c*dilog((I*c*x + c)/(c + 1)) + 2*c*dilog(-(I*c*x - c)/(c + 1))
 - 2*c*dilog((I*c*x + c)/(c - 1)) - 2*c*dilog(-(I*c*x - c)/(c - 1)) - 4*log
(c^2*x^2 + 1))/c
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2 \operatorname{arccot}(cx)}{x^2+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c*x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(x^2*arccot(c*x)/(x^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 \operatorname{acot}(cx)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c*x)/(x**2+1),x)
```

```
[Out] Integral(x**2*acot(c*x)/(x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 \operatorname{arccot}(cx)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c*x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(c*x)/(x^2 + 1), x)
```

3.47 $\int \frac{x\cot^{-1}(cx)}{1+x^2}\,dx$

Optimal. Leaf size=188

$$-\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)+\frac{1}{4}i\text{PolyLog}\left(2,1-\frac{2ic(-x+i)}{(1-c)(1-icx)}\right)+\frac{1}{4}i\text{PolyLog}\left(2,1+\frac{2ic(x+i)}{(c+1)(1-icx)}\right)+\log\left(\frac{2}{1-icx}\right.$$

```
[Out] -(ArcCot[c*x]*Log[2/(1 - I*c*x)]) + (ArcCot[c*x]*Log[((2*I)*c*(I - x))/((1
- c)*(1 - I*c*x))])/2 + (ArcCot[c*x]*Log[((-2*I)*c*(I + x))/((1 + c)*(1 - I
*c*x))])/2 - (I/2)*PolyLog[2, 1 - 2/(1 - I*c*x)] + (I/4)*PolyLog[2, 1 - ((2
*I)*c*(I - x))/((1 - c)*(1 - I*c*x))] + (I/4)*PolyLog[2, 1 + ((2*I)*c*(I +
x))/((1 + c)*(1 - I*c*x))]
```

Rubi [A] time = 0.18417, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {4929, 4857, 2402, 2315, 2447}

$$-\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)+\frac{1}{4}i\text{PolyLog}\left(2,1-\frac{2ic(-x+i)}{(1-c)(1-icx)}\right)+\frac{1}{4}i\text{PolyLog}\left(2,1+\frac{2ic(x+i)}{(c+1)(1-icx)}\right)+\log\left(\frac{2}{1-icx}\right.$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcCot[c*x])/(1 + x^2),x]
```

```
[Out] -(ArcCot[c*x]*Log[2/(1 - I*c*x)]) + (ArcCot[c*x]*Log[((2*I)*c*(I - x))/((1
- c)*(1 - I*c*x))])/2 + (ArcCot[c*x]*Log[((-2*I)*c*(I + x))/((1 + c)*(1 - I
*c*x))])/2 - (I/2)*PolyLog[2, 1 - 2/(1 - I*c*x)] + (I/4)*PolyLog[2, 1 - ((2
*I)*c*(I - x))/((1 - c)*(1 - I*c*x))] + (I/4)*PolyLog[2, 1 + ((2*I)*c*(I +
x))/((1 + c)*(1 - I*c*x))]
```

Rule 4929

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*(x_)^(m_.))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Int[ExpandIntegrand[a + b*ArcCot[c*x], x^m/(d + e*x^2), x], x]
 /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[m] &&  !(EqQ[m, 1] && NeQ[a, 0])
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
```

```
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{x\cot^{-1}(cx)}{1+x^2}\,dx = \int \left(-\frac{\cot^{-1}(cx)}{2(i-x)}+\frac{\cot^{-1}(cx)}{2(i+x)}\right)dx$$

$$= -\left(\frac{1}{2}\int \frac{\cot^{-1}(cx)}{i-x}\,dx\right)+\frac{1}{2}\int \frac{\cot^{-1}(cx)}{i+x}\,dx$$

$$= -\cot^{-1}(cx)\log\left(\frac{2}{1-icx}\right)+\frac{1}{2}\cot^{-1}(cx)\log\left(\frac{2ic(i-x)}{(1-c)(1-icx)}\right)+\frac{1}{2}\cot^{-1}(cx)\log\left(-\frac{2ic(i+x)}{(1+c)(1-icx)}\right)$$

$$= -\cot^{-1}(cx)\log\left(\frac{2}{1-icx}\right)+\frac{1}{2}\cot^{-1}(cx)\log\left(\frac{2ic(i-x)}{(1-c)(1-icx)}\right)+\frac{1}{2}\cot^{-1}(cx)\log\left(-\frac{2ic(i+x)}{(1+c)(1-icx)}\right)$$

$$= -\cot^{-1}(cx)\log\left(\frac{2}{1-icx}\right)+\frac{1}{2}\cot^{-1}(cx)\log\left(\frac{2ic(i-x)}{(1-c)(1-icx)}\right)+\frac{1}{2}\cot^{-1}(cx)\log\left(-\frac{2ic(i+x)}{(1+c)(1-icx)}\right)$$

Mathematica [A] time = 0.0831109, size = 343, normalized size = 1.82

$$-\frac{1}{4}i\text{PolyLog}\left(2,\frac{ic(-x+i)}{1-c}\right)+\frac{1}{4}i\text{PolyLog}\left(2,-\frac{ic(-x+i)}{c+1}\right)+\frac{1}{4}i\text{PolyLog}\left(2,\frac{ic(x+i)}{1-c}\right)-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{ic(x+i)}{c+1}\right)-$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcCot[c*x])/(1 + x^2),x]
```

```
[Out] (-I/4)*Log[I - x]*Log[((-I)*(I - c*x))/(1 - c)] - (I/4)*Log[I + x]*Log[((-I
)*(I - c*x))/(1 + c)] + (I/4)*Log[I - x]*Log[-((I - c*x)/(c*x))] + (I/4)*Lo
g[I + x]*Log[-((I - c*x)/(c*x))] + (I/4)*Log[I + x]*Log[((-I)*(I + c*x))/(1
 - c)] + (I/4)*Log[I - x]*Log[((-I)*(I + c*x))/(1 + c)] - (I/4)*Log[I - x]*
Log[(I + c*x)/(c*x)] - (I/4)*Log[I + x]*Log[(I + c*x)/(c*x)] - (I/4)*PolyLo
g[2, (I*c*(I - x))/(1 - c)] + (I/4)*PolyLog[2, ((-I)*c*(I - x))/(1 + c)] +
(I/4)*PolyLog[2, (I*c*(I + x))/(1 - c)] - (I/4)*PolyLog[2, ((-I)*c*(I + x))
/(1 + c)]
```

Maple [A] time = 0.174, size = 284, normalized size = 1.5

$$\frac{\ln\left(c^2x^2+c^2\right)\operatorname{arccot}(cx)}{2}+\frac{i}{4}\ln(cx-i)\ln\left(\frac{i(cx-i)-c-1}{-c-1}\right)+\frac{i}{4}\ln(cx-i)\ln\left(\frac{i(cx-i)+c-1}{-1+c}\right)-\frac{i}{4}\ln(cx-i)\ln\left(c^2x^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c*x)/(x^2+1),x)
```

```
[Out] 1/2*ln(c^2*x^2+c^2)*arccot(c*x)+1/4*I*ln(c*x-I)*ln((I*(c*x-I)-c-1)/(-c-1))+
1/4*I*ln(c*x-I)*ln((I*(c*x-I)+c-1)/(-1+c))-1/4*I*ln(c*x-I)*ln(c^2*x^2+c^2)+
1/4*I*dilog((I*(c*x-I)-c-1)/(-c-1))+1/4*I*dilog((I*(c*x-I)+c-1)/(-1+c))-1/4
*I*ln(c*x+I)*ln((-I*(c*x+I)-c-1)/(-c-1))-1/4*I*ln(c*x+I)*ln((-I*(c*x+I)+c-1
)/(-1+c))+1/4*I*ln(c*x+I)*ln(c^2*x^2+c^2)-1/4*I*dilog((-I*(c*x+I)-c-1)/(-c-
1))-1/4*I*dilog((-I*(c*x+I)+c-1)/(-1+c))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\operatorname{arccot}(cx)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c*x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] integrate(x*arccot(c*x)/(x^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x \operatorname{arccot}(cx)}{x^2+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c*x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(x*arccot(c*x)/(x^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \operatorname{acot}(cx)}{x^2+1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c*x)/(x**2+1),x)
```

```
[Out] Integral(x*acot(c*x)/(x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \operatorname{arccot}(cx)}{x^2+1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c*x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(c*x)/(x^2 + 1), x)
```

3.48 $\int \frac{\cot^{-1}(cx)}{1+x^2}\,dx$

Optimal. Leaf size=183

$$-\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(-cx+i)}{(1-c)(1-ix)}\right)+\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(cx+i)}{(c+1)(1-ix)}\right)+\frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right)-\frac{1}{2}i\tan^{-1}(x)\log\left(1\right.$$

```
[Out] (I/2)*ArcTan[x]*Log[1 - I/(c*x)] - (I/2)*ArcTan[x]*Log[1 + I/(c*x)] - (I/2)
*ArcTan[x]*Log[((-2*I)*(I - c*x))/((1 - c)*(1 - I*x))] + (I/2)*ArcTan[x]*Lo
g[((-2*I)*(I + c*x))/((1 + c)*(1 - I*x))] - PolyLog[2, 1 + ((2*I)*(I - c*x)
)/((1 - c)*(1 - I*x))]/4 + PolyLog[2, 1 + ((2*I)*(I + c*x))/((1 + c)*(1 - I
*x))]/4
```

Rubi [A] time = 0.464618, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 13, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.083, Rules used = {4909, 203, 2470, 260, 6688, 12, 4876, 4848, 2391, 4856, 2402, 2315, 2447}

$$-\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(-cx+i)}{(1-c)(1-ix)}\right)+\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(cx+i)}{(c+1)(1-ix)}\right)+\frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right)-\frac{1}{2}i\tan^{-1}(x)\log\left(1\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c*x]/(1 + x^2),x]
```

```
[Out] (I/2)*ArcTan[x]*Log[1 - I/(c*x)] - (I/2)*ArcTan[x]*Log[1 + I/(c*x)] - (I/2)
*ArcTan[x]*Log[((-2*I)*(I - c*x))/((1 - c)*(1 - I*x))] + (I/2)*ArcTan[x]*Lo
g[((-2*I)*(I + c*x))/((1 + c)*(1 - I*x))] - PolyLog[2, 1 + ((2*I)*(I - c*x)
)/((1 - c)*(1 - I*x))]/4 + PolyLog[2, 1 + ((2*I)*(I + c*x))/((1 + c)*(1 - I
*x))]/4
```

Rule 4909

```
Int[ArcCot[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I/(c*x)]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I/(c*x)]/(d + e
*x^2), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rule 2470

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))/((f_) + (g_.)
*(x_)^2), x_Symbol] :> With[{u = IntHide[1/(f + g*x^2), x]}, Simp[u*(a + b*
Log[c*(d + e*x^n)^p]), x] - Dist[b*e*n*p, Int[(u*x^(n - 1))/(d + e*x^n), x]
, x]] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && IntegerQ[n]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(cx)}{1+x^2}\,dx = \frac{1}{2}i\int \frac{\log\left(1-\frac{i}{cx}\right)}{1+x^2}\,dx - \frac{1}{2}i\int \frac{\log\left(1+\frac{i}{cx}\right)}{1+x^2}\,dx$$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\int \frac{\tan^{-1}(x)}{\left(1-\frac{i}{cx}\right)x^2}\,dx}{2c} + \frac{\int \frac{\tan^{-1}(x)}{\left(1+\frac{i}{cx}\right)x^2}\,dx}{2c}$$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{\int \frac{c\tan^{-1}(x)}{x(-i+cx)}\,dx}{2c} + \frac{\int \frac{c\tan^{-1}(x)}{x(i+cx)}\,dx}{2c}$$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{1}{2}\int \frac{\tan^{-1}(x)}{x(-i+cx)}\,dx + \frac{1}{2}\int \frac{\tan^{-1}(x)}{x(i+cx)}\,dx$$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) + \frac{1}{2}\int \left(\frac{i\tan^{-1}(x)}{x} - \frac{ic\tan^{-1}(x)}{-i+cx}\right)dx + \frac{1}{2}\int \Bigg(-$$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - \frac{1}{2}(ic)\int \frac{\tan^{-1}(x)}{-i+cx}\,dx + \frac{1}{2}(ic)\int \frac{\tan^{-1}(x)}{i+cx}\,dx$$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(-\frac{2i(i-cx)}{(1-c)(1-ix)}\right) + \frac{1}{2}i\tan^{-1}($$

$$= \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - \frac{1}{2}i\tan^{-1}(x)\log\left(-\frac{2i(i-cx)}{(1-c)(1-ix)}\right) + \frac{1}{2}i\tan^{-1}($$

Mathematica [A] time = 0.0782909, size = 319, normalized size = 1.74

$$-\frac{1}{4}\text{PolyLog}\left(2,\frac{ic(-x+i)}{1-c}\right) + \frac{1}{4}\text{PolyLog}\left(2,-\frac{ic(-x+i)}{c+1}\right) - \frac{1}{4}\text{PolyLog}\left(2,\frac{ic(x+i)}{1-c}\right) + \frac{1}{4}\text{PolyLog}\left(2,-\frac{ic(x+i)}{c+1}\right) - \frac{1}{4}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c*x]/(1 + x^2),x]
```

```
[Out] -(Log[I - x]*Log[((-I)*(I - c*x))/(1 - c)])/4 + (Log[I + x]*Log[((-I)*(I -
c*x))/(1 + c)])/4 + (Log[I - x]*Log[-((I - c*x)/(c*x))])/4 - (Log[I + x]*Lo
g[-((I - c*x)/(c*x))])/4 - (Log[I + x]*Log[((-I)*(I + c*x))/(1 - c)])/4 + (
Log[I - x]*Log[((-I)*(I + c*x))/(1 + c)])/4 - (Log[I - x]*Log[(I + c*x)/(c*
x)])/4 + (Log[I + x]*Log[(I + c*x)/(c*x)])/4 - PolyLog[2, (I*c*(I - x))/(1
- c)]/4 + PolyLog[2, ((-I)*c*(I - x))/(1 + c)]/4 - PolyLog[2, (I*c*(I + x))
/(1 - c)]/4 + PolyLog[2, ((-I)*c*(I + x))/(1 + c)]/4
```

Maple [A] time = 0.184, size = 304, normalized size = 1.7

$$\arctan(x)\,\mathrm{arccot}(cx)+\arctan(cx)\arctan(x)+\frac{i}{2}\arctan(cx)\ln\left(1-\frac{(1+c)(1+icx)^2}{(c^2x^2+1)(1-c)}\right)+\frac{(\arctan(cx))^2}{2}+\frac{1}{4}\mathrm{polylog}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c*x)/(x^2+1),x)
```

```
[Out] arctan(x)*arccot(c*x)+arctan(c*x)*arctan(x)+1/2*I*arctan(c*x)*ln(1-(1+c)*(1
+I*c*x)^2/(c^2*x^2+1)/(1-c))+1/2*arctan(c*x)^2+1/4*polylog(2,(1+c)*(1+I*c*x
)^2/(c^2*x^2+1)/(1-c))-1/2*I*c/(1+c)*arctan(c*x)*ln(1-(-1+c)*(1+I*c*x)^2/(c
^2*x^2+1)/(-c-1))-1/2*I/(1+c)*ln(1-(-1+c)*(1+I*c*x)^2/(c^2*x^2+1)/(-c-1))*a
rctan(c*x)-1/2*c/(1+c)*arctan(c*x)^2-1/4*c/(1+c)*polylog(2,(-1+c)*(1+I*c*x)
^2/(c^2*x^2+1)/(-c-1))-1/2/(1+c)*arctan(c*x)^2-1/4/(1+c)*polylog(2,(-1+c)*(
1+I*c*x)^2/(c^2*x^2+1)/(-c-1))
```

Maxima [A] time = 1.59556, size = 266, normalized size = 1.45

$$-\frac{1}{8}c\left(\frac{8\arctan(cx)\arctan(x)}{c}-\frac{4\arctan(x)\arctan\left(\frac{cx}{c+1},\frac{1}{c+1}\right)-4\arctan(x)\arctan\left(\frac{cx}{c-1},-\frac{1}{c-1}\right)+\log\left(x^2+1\right)\log\left(\frac{c}{c^2}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] -1/8*c*(8*arctan(c*x)*arctan(x)/c - (4*arctan(x)*arctan2(c*x/(c + 1), 1/(c
+ 1)) - 4*arctan(x)*arctan2(c*x/(c - 1), -1/(c - 1)) + log(x^2 + 1)*log((c^
2*x^2 + 1)/(c^2 + 2*c + 1)) - log(x^2 + 1)*log((c^2*x^2 + 1)/(c^2 - 2*c + 1
)) + 2*dilog((I*c*x + c)/(c + 1)) + 2*dilog(-(I*c*x - c)/(c + 1)) - 2*dilog
((I*c*x + c)/(c - 1)) - 2*dilog(-(I*c*x - c)/(c - 1)))/c) + arccot(c*x)*arc
tan(x) + arctan(c*x)*arctan(x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\mathrm{arccot}(cx)}{x^2+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(arccot(c*x)/(x^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(cx)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c*x)/(x**2+1),x)
```

```
[Out] Integral(acot(c*x)/(x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(cx)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(c*x)/(x^2 + 1), x)
```

3.49 $\int \frac{\cot^{-1}(cx)}{x(1+x^2)} dx$

Optimal. Leaf size=223

$$-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{cx}\right)+\frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{cx}\right)+\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)-\frac{1}{4}i\text{PolyLog}\left(2,1-\frac{2ic(-x+i)}{(1-c)(1-icx)}\right)-\frac{1}{4}i\text{Po}$$

```
[Out] ArcCot[c*x]*Log[2/(1 - I*c*x)] - (ArcCot[c*x]*Log[((2*I)*c*(I - x))/((1 - c
)*(1 - I*c*x))])/2 - (ArcCot[c*x]*Log[((-2*I)*c*(I + x))/((1 + c)*(1 - I*c*
x))])/2 - (I/2)*PolyLog[2, (-I)/(c*x)] + (I/2)*PolyLog[2, I/(c*x)] + (I/2)*
PolyLog[2, 1 - 2/(1 - I*c*x)] - (I/4)*PolyLog[2, 1 - ((2*I)*c*(I - x))/((1
- c)*(1 - I*c*x))] - (I/4)*PolyLog[2, 1 + ((2*I)*c*(I + x))/((1 + c)*(1 - I
*c*x))]
```

Rubi [A] time = 0.24714, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 7, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.467, Rules used = {4929, 4849, 2391, 4857, 2402, 2315, 2447}

$$-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{i}{cx}\right)+\frac{1}{2}i\text{PolyLog}\left(2,\frac{i}{cx}\right)+\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)-\frac{1}{4}i\text{PolyLog}\left(2,1-\frac{2ic(-x+i)}{(1-c)(1-icx)}\right)-\frac{1}{4}i\text{Po}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c*x]/(x*(1 + x^2)),x]
```

```
[Out] ArcCot[c*x]*Log[2/(1 - I*c*x)] - (ArcCot[c*x]*Log[((2*I)*c*(I - x))/((1 - c
)*(1 - I*c*x))])/2 - (ArcCot[c*x]*Log[((-2*I)*c*(I + x))/((1 + c)*(1 - I*c*
x))])/2 - (I/2)*PolyLog[2, (-I)/(c*x)] + (I/2)*PolyLog[2, I/(c*x)] + (I/2)*
PolyLog[2, 1 - 2/(1 - I*c*x)] - (I/4)*PolyLog[2, 1 - ((2*I)*c*(I - x))/((1
- c)*(1 - I*c*x))] - (I/4)*PolyLog[2, 1 + ((2*I)*c*(I + x))/((1 + c)*(1 - I
*c*x))]
```

Rule 4929

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*(x_)^(m_.))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Int[ExpandIntegrand[a + b*ArcCot[c*x], x^m/(d + e*x^2), x], x]
 /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[m] &&  !(EqQ[m, 1] && NeQ[a, 0])
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(cx)}{x\left(1+x^2\right)}\,dx = \int \left(\frac{\cot^{-1}(cx)}{x} - \frac{x\cot^{-1}(cx)}{1+x^2}\right) dx$$

$$= \int \frac{\cot^{-1}(cx)}{x}\,dx - \int \frac{x\cot^{-1}(cx)}{1+x^2}\,dx$$

$$= \frac{1}{2}i\int \frac{\log\left(1-\frac{i}{cx}\right)}{x}\,dx - \frac{1}{2}i\int \frac{\log\left(1+\frac{i}{cx}\right)}{x}\,dx - \int \left(-\frac{\cot^{-1}(cx)}{2(i-x)} + \frac{\cot^{-1}(cx)}{2(i+x)}\right) dx$$

$$= -\frac{1}{2}i\mathrm{Li}_2\left(-\frac{i}{cx}\right) + \frac{1}{2}i\mathrm{Li}_2\left(\frac{i}{cx}\right) + \frac{1}{2}\int \frac{\cot^{-1}(cx)}{i-x}\,dx - \frac{1}{2}\int \frac{\cot^{-1}(cx)}{i+x}\,dx$$

$$= \cot^{-1}(cx)\log\left(\frac{2}{1-icx}\right) - \frac{1}{2}\cot^{-1}(cx)\log\left(\frac{2ic(i-x)}{(1-c)(1-icx)}\right) - \frac{1}{2}\cot^{-1}(cx)\log\left(-\frac{2ic(i+x)}{(1+c)(1-icx)}\right) - \frac{1}{2}i$$

$$= \cot^{-1}(cx)\log\left(\frac{2}{1-icx}\right) - \frac{1}{2}\cot^{-1}(cx)\log\left(\frac{2ic(i-x)}{(1-c)(1-icx)}\right) - \frac{1}{2}\cot^{-1}(cx)\log\left(-\frac{2ic(i+x)}{(1+c)(1-icx)}\right) - \frac{1}{2}i$$

$$= \cot^{-1}(cx)\log\left(\frac{2}{1-icx}\right) - \frac{1}{2}\cot^{-1}(cx)\log\left(\frac{2ic(i-x)}{(1-c)(1-icx)}\right) - \frac{1}{2}\cot^{-1}(cx)\log\left(-\frac{2ic(i+x)}{(1+c)(1-icx)}\right) - \frac{1}{2}i$$

Mathematica [A] time = 0.0912358, size = 379, normalized size = 1.7

$$\frac{1}{4}i\mathrm{PolyLog}\left(2,\frac{ic(-x+i)}{1-c}\right) - \frac{1}{4}i\mathrm{PolyLog}\left(2,-\frac{ic(-x+i)}{c+1}\right) - \frac{1}{2}i\mathrm{PolyLog}\left(2,-\frac{i}{cx}\right) + \frac{1}{2}i\mathrm{PolyLog}\left(2,\frac{i}{cx}\right) - \frac{1}{4}i\mathrm{PolyLog}\left(2\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c*x]/(x*(1 + x^2)),x]
```

```
[Out] (I/4)*Log[I - x]*Log[((-I)*(I - c*x))/(1 - c)] + (I/4)*Log[I + x]*Log[((-I)
*(I - c*x))/(1 + c)] - (I/4)*Log[I - x]*Log[-((I - c*x)/(c*x))] - (I/4)*Log
[I + x]*Log[-((I - c*x)/(c*x))] - (I/4)*Log[I + x]*Log[((-I)*(I + c*x))/(1
- c)] - (I/4)*Log[I - x]*Log[((-I)*(I + c*x))/(1 + c)] + (I/4)*Log[I - x]*L
og[(I + c*x)/(c*x)] + (I/4)*Log[I + x]*Log[(I + c*x)/(c*x)] + (I/4)*PolyLog
[2, (I*c*(I - x))/(1 - c)] - (I/4)*PolyLog[2, ((-I)*c*(I - x))/(1 + c)] - (
I/2)*PolyLog[2, (-I)/(c*x)] + (I/2)*PolyLog[2, I/(c*x)] - (I/4)*PolyLog[2,
(I*c*(I + x))/(1 - c)] + (I/4)*PolyLog[2, ((-I)*c*(I + x))/(1 + c)]
```

Maple [A] time = 0.149, size = 345, normalized size = 1.6

$$-\frac{\ln\left(c^2x^2+c^2\right)\operatorname{arccot}(cx)}{2} + \operatorname{arccot}(cx)\ln(cx) + \frac{i}{4}\ln(cx+i)\ln\left(\frac{-i(cx+i)-c-1}{-c-1}\right) + \frac{i}{4}\mathrm{dilog}\left(\frac{-i(cx+i)+c-1}{-1+c}\right) + \frac{i}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c*x)/x/(x^2+1),x)
```

```
[Out] -1/2*ln(c^2*x^2+c^2)*arccot(c*x)+arccot(c*x)*ln(c*x)+1/4*I*ln(c*x+I)*ln((-I
*(c*x+I)-c-1)/(-c-1))+1/4*I*dilog((-I*(c*x+I)+c-1)/(-1+c))+1/2*I*dilog(1-I*
c*x)-1/2*I*dilog(1+I*c*x)+1/2*I*ln(c*x)*ln(1-I*c*x)-1/4*I*dilog((I*(c*x-I)-
c-1)/(-c-1))-1/4*I*ln(c*x+I)*ln(c^2*x^2+c^2)-1/4*I*ln(c*x-I)*ln((I*(c*x-I)+
c-1)/(-1+c))-1/4*I*dilog((I*(c*x-I)+c-1)/(-1+c))+1/4*I*ln(c*x-I)*ln(c^2*x^2
+c^2)-1/2*I*ln(c*x)*ln(1+I*c*x)-1/4*I*ln(c*x-I)*ln((I*(c*x-I)-c-1)/(-c-1))+
1/4*I*ln(c*x+I)*ln((-I*(c*x+I)+c-1)/(-1+c))+1/4*I*dilog((-I*(c*x+I)-c-1)/(-
c-1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(cx)}{(x^2+1)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/x/(x^2+1),x, algorithm="maxima")
```

```
[Out] integrate(arccot(c*x)/((x^2 + 1)*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(cx)}{x^3+x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/x/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(arccot(c*x)/(x^3 + x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(cx)}{x(x^2+1)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c*x)/x/(x**2+1),x)
```

```
[Out] Integral(acot(c*x)/(x*(x**2 + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(cx)}{(x^2+1)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/x/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(c*x)/((x^2 + 1)*x), x)
```

3.50 $\int \frac{\cot^{-1}(cx)}{x^2(1+x^2)} dx$

Optimal. Leaf size=212

$$\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(-cx+i)}{(1-c)(1-ix)}\right)-\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(cx+i)}{(c+1)(1-ix)}\right)+\frac{1}{2}c\log\left(c^2x^2+1\right)-c\log(x)-\frac{\cot^{-1}(cx)}{x}-\frac{1}{2}i$$

```
[Out] -(ArcCot[c*x]/x) - (I/2)*ArcTan[x]*Log[1 - I/(c*x)] + (I/2)*ArcTan[x]*Log[1
 + I/(c*x)] - c*Log[x] + (I/2)*ArcTan[x]*Log[((-2*I)*(I - c*x))/((1 - c)*(1
 - I*x))] - (I/2)*ArcTan[x]*Log[((-2*I)*(I + c*x))/((1 + c)*(1 - I*x))] + (
c*Log[1 + c^2*x^2])/2 + PolyLog[2, 1 + ((2*I)*(I - c*x))/((1 - c)*(1 - I*x)
)]/4 - PolyLog[2, 1 + ((2*I)*(I + c*x))/((1 + c)*(1 - I*x))]/4
```

Rubi [A] time = 0.503106, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 31, number of rules used = 19, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.267, Rules used = {4919, 4853, 266, 36, 29, 31, 4909, 203, 2470, 260, 6688, 12, 4876, 4848, 2391, 4856, 2402, 2315, 2447}

$$\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(-cx+i)}{(1-c)(1-ix)}\right)-\frac{1}{4}\text{PolyLog}\left(2,1+\frac{2i(cx+i)}{(c+1)(1-ix)}\right)+\frac{1}{2}c\log\left(c^2x^2+1\right)-c\log(x)-\frac{\cot^{-1}(cx)}{x}-\frac{1}{2}i$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c*x]/(x^2*(1 + x^2)),x]
```

```
[Out] -(ArcCot[c*x]/x) - (I/2)*ArcTan[x]*Log[1 - I/(c*x)] + (I/2)*ArcTan[x]*Log[1
 + I/(c*x)] - c*Log[x] + (I/2)*ArcTan[x]*Log[((-2*I)*(I - c*x))/((1 - c)*(1
 - I*x))] - (I/2)*ArcTan[x]*Log[((-2*I)*(I + c*x))/((1 + c)*(1 - I*x))] + (
c*Log[1 + c^2*x^2])/2 + PolyLog[2, 1 + ((2*I)*(I - c*x))/((1 - c)*(1 - I*x)
)]/4 - PolyLog[2, 1 + ((2*I)*(I + c*x))/((1 + c)*(1 - I*x))]/4
```

Rule 4919

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcCot[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcCot[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4909

```
Int[ArcCot[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I/(c*x)]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I/(c*x)]/(d + e
*x^2), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2470

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))/((f_) + (g_.)
*(x_)^2), x_Symbol] :> With[{u = IntHide[1/(f + g*x^2), x]}, Simp[u*(a + b*
Log[c*(d + e*x^n)^p]), x] - Dist[b*e*n*p, Int[(u*x^(n - 1))/(d + e*x^n), x]
```

```
, x]] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && IntegerQ[n]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(cx)}{x^2\left(1+x^2\right)}\,dx = \int \frac{\cot^{-1}(cx)}{x^2}\,dx - \int \frac{\cot^{-1}(cx)}{1+x^2}\,dx$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\int \frac{\log\left(1-\frac{i}{cx}\right)}{1+x^2}\,dx + \frac{1}{2}i\int \frac{\log\left(1+\frac{i}{cx}\right)}{1+x^2}\,dx - c\int \frac{1}{x\left(1+c^2x^2\right)}\,dx$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - \frac{\int \frac{\tan^{-1}(x)}{\left(1-\frac{i}{cx}\right)x^2}\,dx}{2c} - \frac{\int \frac{\tan^{-1}(x)}{\left(1+\frac{i}{cx}\right)x^2}\,dx}{2c}$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - \frac{\int \frac{c\tan^{-1}(x)}{x(-i+cx)}\,dx}{2c} - \frac{\int \frac{c\tan^{-1}(x)}{x(i+cx)}\,dx}{2c}$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - c\log(x) + \frac{1}{2}c\log\left(1+c^2x^2\right) -$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - c\log(x) + \frac{1}{2}c\log\left(1+c^2x^2\right) -$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - c\log(x) + \frac{1}{2}c\log\left(1+c^2x^2\right) +$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - c\log(x) + \frac{1}{2}i\tan^{-1}(x)\log\left(-\right.$$

$$= -\frac{\cot^{-1}(cx)}{x} - \frac{1}{2}i\tan^{-1}(x)\log\left(1-\frac{i}{cx}\right) + \frac{1}{2}i\tan^{-1}(x)\log\left(1+\frac{i}{cx}\right) - c\log(x) + \frac{1}{2}i\tan^{-1}(x)\log\left(-\right.$$

Mathematica [A] time = 0.0847863, size = 348, normalized size = 1.64

$$\frac{1}{4}\text{PolyLog}\left(2,\frac{ic(-x+i)}{1-c}\right) - \frac{1}{4}\text{PolyLog}\left(2,-\frac{ic(-x+i)}{c+1}\right) + \frac{1}{4}\text{PolyLog}\left(2,\frac{ic(x+i)}{1-c}\right) - \frac{1}{4}\text{PolyLog}\left(2,-\frac{ic(x+i)}{c+1}\right) + \frac{1}{2}c\,\mathrm{l}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c*x]/(x^2*(1 + x^2)),x]
```

```
[Out] -(ArcCot[c*x]/x) - c*Log[x] + (Log[I - x]*Log[((-I)*(I - c*x))/(1 - c)])/4
- (Log[I + x]*Log[((-I)*(I - c*x))/(1 + c)])/4 - (Log[I - x]*Log[-((I - c*x
)/(c*x))])/4 + (Log[I + x]*Log[-((I - c*x)/(c*x))])/4 + (Log[I + x]*Log[((-
I)*(I + c*x))/(1 - c)])/4 - (Log[I - x]*Log[((-I)*(I + c*x))/(1 + c)])/4 +
(Log[I - x]*Log[(I + c*x)/(c*x)])/4 - (Log[I + x]*Log[(I + c*x)/(c*x)])/4 +
 (c*Log[1 + c^2*x^2])/2 + PolyLog[2, (I*c*(I - x))/(1 - c)]/4 - PolyLog[2,
((-I)*c*(I - x))/(1 + c)]/4 + PolyLog[2, (I*c*(I + x))/(1 - c)]/4 - PolyLog
```

```
[2, ((-I)*c*(I + x))/(1 + c)]/4
```

Maple [A] time = 0.207, size = 271, normalized size = 1.3

$$-\arctan(x)\operatorname{arccot}(cx)-\frac{\operatorname{arccot}(cx)}{x}+\frac{c\ln\left(c^2x^2+1\right)}{2}-c\ln(x)+\frac{\frac{i}{2}c\arctan(x)}{-1+c}\ln\left(1-\frac{(1+c)(1+ix)^2}{\left(x^2+1\right)(-1+c)}\right)-\frac{\frac{i}{2}\arctan}{-1+c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c*x)/x^2/(x^2+1),x)
```

```
[Out] -arctan(x)*arccot(c*x)-arccot(c*x)/x+1/2*c*ln(c^2*x^2+1)-c*ln(x)+1/2*I*c/(-
1+c)*ln(1-(1+c)*(1+I*x)^2/(x^2+1)/(-1+c))*arctan(x)-1/2*I/(-1+c)*ln(1-(1+c)
*(1+I*x)^2/(x^2+1)/(-1+c))*arctan(x)+1/2*c/(-1+c)*arctan(x)^2+1/4*c/(-1+c)*
polylog(2,(1+c)*(1+I*x)^2/(x^2+1)/(-1+c))-1/2/(-1+c)*arctan(x)^2-1/4/(-1+c)
*polylog(2,(1+c)*(1+I*x)^2/(x^2+1)/(-1+c))-1/2*I*arctan(x)*ln(1-(-1+c)*(1+I
*x)^2/(x^2+1)/(1+c))-1/2*arctan(x)^2-1/4*polylog(2,(-1+c)*(1+I*x)^2/(x^2+1)
/(1+c))
```

Maxima [A] time = 1.54924, size = 261, normalized size = 1.23

$$-\left(\frac{1}{x}+\arctan(x)\right)\operatorname{arccot}(cx)-\frac{1}{2}\arctan(x)\arctan\left(\frac{cx}{c+1},\frac{1}{c+1}\right)+\frac{1}{2}\arctan(x)\arctan\left(\frac{cx}{c-1},-\frac{1}{c-1}\right)+\frac{1}{2}c\log\left(c^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/x^2/(x^2+1),x, algorithm="maxima")
```

```
[Out] -(1/x + arctan(x))*arccot(c*x) - 1/2*arctan(x)*arctan2(c*x/(c + 1), 1/(c +
1)) + 1/2*arctan(x)*arctan2(c*x/(c - 1), -1/(c - 1)) + 1/2*c*log(c^2*x^2 +
1) - c*log(x) - 1/8*log(x^2 + 1)*log((c^2*x^2 + 1)/(c^2 + 2*c + 1)) + 1/8*l
og(x^2 + 1)*log((c^2*x^2 + 1)/(c^2 - 2*c + 1)) - 1/4*dilog((I*c*x + c)/(c +
 1)) - 1/4*dilog(-(I*c*x - c)/(c + 1)) + 1/4*dilog((I*c*x + c)/(c - 1)) + 1
/4*dilog(-(I*c*x - c)/(c - 1))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(cx)}{x^4+x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/x^2/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(arccot(c*x)/(x^4 + x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(cx)}{x^2(x^2+1)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c*x)/x**2/(x**2+1),x)
```

```
[Out] Integral(acot(c*x)/(x**2*(x**2 + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(cx)}{(x^2+1)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c*x)/x^2/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(arccot(c*x)/((x^2 + 1)*x^2), x)
```

3.51 $\int \frac{1}{(1+x^2)\cot^{-1}(x)}\,dx$

Optimal. Leaf size=5

$$-\log\left(\cot^{-1}(x)\right)$$

```
[Out] -Log[ArcCot[x]]
```

Rubi [A] time = 0.0199193, antiderivative size = 5, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4883}

$$-\log\left(\cot^{-1}(x)\right)$$

Antiderivative was successfully verified.

```
[In] Int[1/((1 + x^2)*ArcCot[x]),x]
```

```
[Out] -Log[ArcCot[x]]
```

Rule 4883

```
Int[1/(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)), x_Symbol]
 :> -Simp[Log[RemoveContent[a + b*ArcCot[c*x], x]]/(b*c*d), x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{1}{\left(1+x^2\right)\cot^{-1}(x)}\,dx = -\log\left(\cot^{-1}(x)\right)$$

Mathematica [A] time = 0.0226783, size = 5, normalized size = 1.

$$-\log\left(\cot^{-1}(x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((1 + x^2)*ArcCot[x]),x]

[Out] -Log[ArcCot[x]]
```

Maple [A] time = 0.019, size = 6, normalized size = 1.2

$$-\ln(\operatorname{arccot}(x))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2+1)/arccot(x),x)

[Out] -ln(arccot(x))
```

Maxima [A] time = 0.946703, size = 7, normalized size = 1.4

$$-\log(\operatorname{arccot}(x))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(x^2+1)/arccot(x),x, algorithm="maxima")

[Out] -log(arccot(x))
```

Fricas [A] time = 1.76909, size = 23, normalized size = 4.6

$$-\log(\operatorname{arccot}(x))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(x^2+1)/arccot(x),x, algorithm="fricas")

[Out] -log(arccot(x))
```

Sympy [A] time = 0.344778, size = 5, normalized size = 1.

$$-\log\left(\operatorname{acot}\left(x\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(x**2+1)/acot(x),x)
```

```
[Out] -log(acot(x))
```

Giac [A] time = 1.09545, size = 11, normalized size = 2.2

$$-\log\left(\left|\arctan\left(\frac{1}{x}\right)\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(x^2+1)/arccot(x),x, algorithm="giac")
```

```
[Out] -log(abs(arctan(1/x)))
```

3.52 $\int \frac{\cot^{-1}(x)^n}{1+x^2} dx$

Optimal. Leaf size=13

$$-\frac{\cot^{-1}(x)^{n+1}}{n+1}$$

```
[Out] -(ArcCot[x]^(1 + n)/(1 + n))
```

Rubi [A] time = 0.0235998, antiderivative size = 13, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {4885}

$$-\frac{\cot^{-1}(x)^{n+1}}{n+1}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]^n/(1 + x^2),x]
```

```
[Out] -(ArcCot[x]^(1 + n)/(1 + n))
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)^n}{1+x^2} dx = -\frac{\cot^{-1}(x)^{1+n}}{1+n}$$

Mathematica [A] time = 0.0070566, size = 13, normalized size = 1.

$$-\frac{\cot^{-1}(x)^{n+1}}{n+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]^n/(1 + x^2),x]
```

```
[Out] -(ArcCot[x]^(1 + n)/(1 + n))
```

Maple [A] time = 0.038, size = 14, normalized size = 1.1

$$-\frac{(\operatorname{arccot}(x))^{1+n}}{1+n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)^n/(x^2+1),x)
```

```
[Out] -arccot(x)^(1+n)/(1+n)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)^n/(x^2+1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.99926, size = 43, normalized size = 3.31

$$-\frac{\operatorname{arccot}(x)^n \operatorname{arccot}(x)}{n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)^n/(x^2+1),x, algorithm="fricas")
```

```
[Out] -arccot(x)^n*arccot(x)/(n + 1)
```

Sympy [A] time = 4.60103, size = 17, normalized size = 1.31

$$-\begin{cases} \frac{\operatorname{acot}^{n+1}(x)}{n+1} & \text{for } n \neq -1 \\ \log(\operatorname{acot}(x)) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)**n/(x**2+1),x)
```

```
[Out] -Piecewise((acot(x)**(n + 1)/(n + 1), Ne(n, -1)), (log(acot(x)), True))
```

Giac [A] time = 1.09028, size = 20, normalized size = 1.54

$$-\frac{\arctan\left(\frac{1}{x}\right)^{n+1}}{n+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)^n/(x^2+1),x, algorithm="giac")
```

```
[Out] -arctan(1/x)^(n + 1)/(n + 1)
```

3.53 $\int \left(c+dx^2\right)^4 \cot^{-1}(ax)\,dx$

Optimal. Leaf size=244

$$\frac{d^2x^4\left(378a^4c^2-180a^2cd+35d^2\right)}{1260a^5}+\frac{dx^2\left(-378a^4c^2d+420a^6c^3+180a^2cd^2-35d^3\right)}{630a^7}+\frac{\left(378a^4c^2d^2-420a^6c^3d+315a^8c^4\right.}{630}$$

```
[Out] (d*(420*a^6*c^3 - 378*a^4*c^2*d + 180*a^2*c*d^2 - 35*d^3)*x^2)/(630*a^7) +
(d^2*(378*a^4*c^2 - 180*a^2*c*d + 35*d^2)*x^4)/(1260*a^5) + ((36*a^2*c - 7*
d)*d^3*x^6)/(378*a^3) + (d^4*x^8)/(72*a) + c^4*x*ArcCot[a*x] + (4*c^3*d*x^3
*ArcCot[a*x])/3 + (6*c^2*d^2*x^5*ArcCot[a*x])/5 + (4*c*d^3*x^7*ArcCot[a*x])
/7 + (d^4*x^9*ArcCot[a*x])/9 + ((315*a^8*c^4 - 420*a^6*c^3*d + 378*a^4*c^2*
d^2 - 180*a^2*c*d^3 + 35*d^4)*Log[1 + a^2*x^2])/(630*a^9)
```

Rubi [A] time = 0.176358, antiderivative size = 244, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {194, 4913, 1810, 260}

$$\frac{d^2x^4\left(378a^4c^2-180a^2cd+35d^2\right)}{1260a^5}+\frac{dx^2\left(-378a^4c^2d+420a^6c^3+180a^2cd^2-35d^3\right)}{630a^7}+\frac{\left(378a^4c^2d^2-420a^6c^3d+315a^8c^4\right.}{630}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x^2)^4*ArcCot[a*x],x]
```

```
[Out] (d*(420*a^6*c^3 - 378*a^4*c^2*d + 180*a^2*c*d^2 - 35*d^3)*x^2)/(630*a^7) +
(d^2*(378*a^4*c^2 - 180*a^2*c*d + 35*d^2)*x^4)/(1260*a^5) + ((36*a^2*c - 7*
d)*d^3*x^6)/(378*a^3) + (d^4*x^8)/(72*a) + c^4*x*ArcCot[a*x] + (4*c^3*d*x^3
*ArcCot[a*x])/3 + (6*c^2*d^2*x^5*ArcCot[a*x])/5 + (4*c*d^3*x^7*ArcCot[a*x])
/7 + (d^4*x^9*ArcCot[a*x])/9 + ((315*a^8*c^4 - 420*a^6*c^3*d + 378*a^4*c^2*
d^2 - 180*a^2*c*d^3 + 35*d^4)*Log[1 + a^2*x^2])/(630*a^9)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
```

```
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \left(c+dx^2\right)^4 \cot^{-1}(ax)\,dx = c^4 x \cot^{-1}(ax) + \frac{4}{3}c^3 d x^3 \cot^{-1}(ax) + \frac{6}{5}c^2 d^2 x^5 \cot^{-1}(ax) + \frac{4}{7}c d^3 x^7 \cot^{-1}(ax) + \frac{1}{9}d^4 x^9 \cot^{-1}$$

$$= c^4 x \cot^{-1}(ax) + \frac{4}{3}c^3 d x^3 \cot^{-1}(ax) + \frac{6}{5}c^2 d^2 x^5 \cot^{-1}(ax) + \frac{4}{7}c d^3 x^7 \cot^{-1}(ax) + \frac{1}{9}d^4 x^9 \cot^{-1}$$

$$= \frac{d\left(420a^6c^3 - 378a^4c^2d + 180a^2cd^2 - 35d^3\right)x^2}{630a^7} + \frac{d^2\left(378a^4c^2 - 180a^2cd + 35d^2\right)x^4}{1260a^5} + \frac{(36a}{}$$

$$= \frac{d\left(420a^6c^3 - 378a^4c^2d + 180a^2cd^2 - 35d^3\right)x^2}{630a^7} + \frac{d^2\left(378a^4c^2 - 180a^2cd + 35d^2\right)x^4}{1260a^5} + \frac{(36a}{}$$

Mathematica [A] time = 0.161579, size = 212, normalized size = 0.87

$$\frac{a^2dx^2\left(3a^6\left(756c^2dx^2 + 1680c^3 + 240cd^2x^4 + 35d^3x^6\right) - 4a^4d\left(1134c^2 + 270cdx^2 + 35d^2x^4\right) + 30a^2d^2\left(72c + 7dx^2\right) - 42}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x^2)^4*ArcCot[a*x],x]
```

```
[Out] (a^2*d*x^2*(-420*d^3 + 30*a^2*d^2*(72*c + 7*d*x^2) - 4*a^4*d*(1134*c^2 + 27
0*c*d*x^2 + 35*d^2*x^4) + 3*a^6*(1680*c^3 + 756*c^2*d*x^2 + 240*c*d^2*x^4 +
 35*d^3*x^6)) + 24*a^9*x*(315*c^4 + 420*c^3*d*x^2 + 378*c^2*d^2*x^4 + 180*c
*d^3*x^6 + 35*d^4*x^8)*ArcCot[a*x] + 12*(315*a^8*c^4 - 420*a^6*c^3*d + 378*
a^4*c^2*d^2 - 180*a^2*c*d^3 + 35*d^4)*Log[1 + a^2*x^2])/(7560*a^9)
```

Maple [A] time = 0.044, size = 279, normalized size = 1.1

$$\frac{d^4x^9\mathrm{arccot}\,(ax)}{9}+\frac{4\,cd^3x^7\mathrm{arccot}\,(ax)}{7}+\frac{6\,c^2d^2x^5\mathrm{arccot}\,(ax)}{5}+\frac{4\,c^3dx^3\mathrm{arccot}\,(ax)}{3}+c^4x\mathrm{arccot}\,(ax)+\frac{2\,dc^3x^2}{3\,a}+\frac{3\,c^2d^2}{10\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x^2+c)^4*arccot(a*x),x)
```

```
[Out] 1/9*d^4*x^9*arccot(a*x)+4/7*c*d^3*x^7*arccot(a*x)+6/5*c^2*d^2*x^5*arccot(a*
x)+4/3*c^3*d*x^3*arccot(a*x)+c^4*x*arccot(a*x)+2/3/a*c^3*d*x^2+3/10/a*c^2*d
^2*x^4+2/21/a*c*d^3*x^6-3/5/a^3*c^2*d^2*x^2+1/72*d^4*x^8/a-1/7/a^3*x^4*c*d^
3-1/54/a^3*d^4*x^6+2/7/a^5*x^2*c*d^3+1/36/a^5*d^4*x^4-1/18/a^7*x^2*d^4+1/2/
a*ln(a^2*x^2+1)*c^4-2/3/a^3*ln(a^2*x^2+1)*c^3*d+3/5/a^5*ln(a^2*x^2+1)*c^2*d
^2-2/7/a^7*ln(a^2*x^2+1)*c*d^3+1/18/a^9*ln(a^2*x^2+1)*d^4
```

Maxima [A] time = 1.0026, size = 305, normalized size = 1.25

$$\frac{1}{7560}\,a\left(\frac{105\,a^6d^4x^8+20\left(36\,a^6cd^3-7\,a^4d^4\right)x^6+6\left(378\,a^6c^2d^2-180\,a^4cd^3+35\,a^2d^4\right)x^4+12\left(420\,a^6c^3d-378\,a^4c^2d^2+1\right.}{a^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^4*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/7560*a*((105*a^6*d^4*x^8 + 20*(36*a^6*c*d^3 - 7*a^4*d^4)*x^6 + 6*(378*a^6
*c^2*d^2 - 180*a^4*c*d^3 + 35*a^2*d^4)*x^4 + 12*(420*a^6*c^3*d - 378*a^4*c^
2*d^2 + 180*a^2*c*d^3 - 35*d^4)*x^2)/a^8 + 12*(315*a^8*c^4 - 420*a^6*c^3*d
+ 378*a^4*c^2*d^2 - 180*a^2*c*d^3 + 35*d^4)*log(a^2*x^2 + 1)/a^10) + 1/315*
(35*d^4*x^9 + 180*c*d^3*x^7 + 378*c^2*d^2*x^5 + 420*c^3*d*x^3 + 315*c^4*x)*
arccot(a*x)
```

Fricas [A] time = 1.91021, size = 540, normalized size = 2.21

$$105\,a^8d^4x^8+20\left(36\,a^8cd^3-7\,a^6d^4\right)x^6+6\left(378\,a^8c^2d^2-180\,a^6cd^3+35\,a^4d^4\right)x^4+12\left(420\,a^8c^3d-378\,a^6c^2d^2+180\,a^4cd^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^4*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/7560*(105*a^8*d^4*x^8 + 20*(36*a^8*c*d^3 - 7*a^6*d^4)*x^6 + 6*(378*a^8*c^
2*d^2 - 180*a^6*c*d^3 + 35*a^4*d^4)*x^4 + 12*(420*a^8*c^3*d - 378*a^6*c^2*d
^2 + 180*a^4*c*d^3 - 35*a^2*d^4)*x^2 + 24*(35*a^9*d^4*x^9 + 180*a^9*c*d^3*x
^7 + 378*a^9*c^2*d^2*x^5 + 420*a^9*c^3*d*x^3 + 315*a^9*c^4*x)*arccot(a*x) +
 12*(315*a^8*c^4 - 420*a^6*c^3*d + 378*a^4*c^2*d^2 - 180*a^2*c*d^3 + 35*d^4
)*log(a^2*x^2 + 1))/a^9
```

Sympy [A] time = 6.18352, size = 367, normalized size = 1.5

$$\begin{cases} c^4 x \operatorname{acot}(ax) + \frac{4c^3dx^3 \operatorname{acot}(ax)}{3} + \frac{6c^2d^2x^5 \operatorname{acot}(ax)}{5} + \frac{4cd^3x^7 \operatorname{acot}(ax)}{7} + \frac{d^4x^9 \operatorname{acot}(ax)}{9} + \frac{c^4 \log\left(x^2+\frac{1}{a^2}\right)}{2a} + \frac{2c^3dx^2}{3a} + \frac{3c^2d^2x^4}{10a} + \frac{2cd^3x^6}{21a} + \\ \frac{\pi\left(c^4x+\frac{4c^3dx^3}{3}+\frac{6c^2d^2x^5}{5}+\frac{4cd^3x^7}{7}+\frac{d^4x^9}{9}\right)}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x**2+c)**4*acot(a*x),x)
```

```
[Out] Piecewise((c**4*x*acot(a*x) + 4*c**3*d*x**3*acot(a*x)/3 + 6*c**2*d**2*x**5*
acot(a*x)/5 + 4*c*d**3*x**7*acot(a*x)/7 + d**4*x**9*acot(a*x)/9 + c**4*log(
x**2 + a**(-2))/(2*a) + 2*c**3*d*x**2/(3*a) + 3*c**2*d**2*x**4/(10*a) + 2*c
*d**3*x**6/(21*a) + d**4*x**8/(72*a) - 2*c**3*d*log(x**2 + a**(-2))/(3*a**3
) - 3*c**2*d**2*x**2/(5*a**3) - c*d**3*x**4/(7*a**3) - d**4*x**6/(54*a**3)
+ 3*c**2*d**2*log(x**2 + a**(-2))/(5*a**5) + 2*c*d**3*x**2/(7*a**5) + d**4*
x**4/(36*a**5) - 2*c*d**3*log(x**2 + a**(-2))/(7*a**7) - d**4*x**2/(18*a**7
) + d**4*log(x**2 + a**(-2))/(18*a**9), Ne(a, 0)), (pi*(c**4*x + 4*c**3*d*x
**3/3 + 6*c**2*d**2*x**5/5 + 4*c*d**3*x**7/7 + d**4*x**9/9)/2, True))
```

Giac [A] time = 1.11988, size = 320, normalized size = 1.31

$$\frac{1}{315}\left(35\,d^4x^9 + 180\,cd^3x^7 + 378\,c^2d^2x^5 + 420\,c^3dx^3 + 315\,c^4x\right)\arctan\left(\frac{1}{ax}\right) + \frac{105\,a^7d^4x^8 + 720\,a^7cd^3x^6 + 2268\,a^7c^2d^2x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^4*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/315*(35*d^4*x^9 + 180*c*d^3*x^7 + 378*c^2*d^2*x^5 + 420*c^3*d*x^3 + 315*c
^4*x)*arctan(1/(a*x)) + 1/7560*(105*a^7*d^4*x^8 + 720*a^7*c*d^3*x^6 + 2268*
a^7*c^2*d^2*x^4 - 140*a^5*d^4*x^6 + 5040*a^7*c^3*d*x^2 - 1080*a^5*c*d^3*x^4
 - 4536*a^5*c^2*d^2*x^2 + 210*a^3*d^4*x^4 + 2160*a^3*c*d^3*x^2 - 420*a*d^4*
x^2)/a^8 + 1/630*(315*a^8*c^4 - 420*a^6*c^3*d + 378*a^4*c^2*d^2 - 180*a^2*c
*d^3 + 35*d^4)*log(a^2*x^2 + 1)/a^9
```

3.54 $\int \left(c+dx^2\right)^3 \cot^{-1}(ax)\,dx$

Optimal. Leaf size=168

$$\frac{dx^2\left(35a^4c^2-21a^2cd+5d^2\right)}{70a^5}+\frac{\left(-35a^4c^2d+35a^6c^3+21a^2cd^2-5d^3\right)\log\left(a^2x^2+1\right)}{70a^7}+\frac{d^2x^4\left(21a^2c-5d\right)}{140a^3}+c^2dx^3\cot^{-1}$$

```
[Out] (d*(35*a^4*c^2 - 21*a^2*c*d + 5*d^2)*x^2)/(70*a^5) + ((21*a^2*c - 5*d)*d^2*
x^4)/(140*a^3) + (d^3*x^6)/(42*a) + c^3*x*ArcCot[a*x] + c^2*d*x^3*ArcCot[a*
x] + (3*c*d^2*x^5*ArcCot[a*x])/5 + (d^3*x^7*ArcCot[a*x])/7 + ((35*a^6*c^3 -
 35*a^4*c^2*d + 21*a^2*c*d^2 - 5*d^3)*Log[1 + a^2*x^2])/(70*a^7)
```

Rubi [A] time = 0.120067, antiderivative size = 168, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {194, 4913, 1810, 260}

$$\frac{dx^2\left(35a^4c^2-21a^2cd+5d^2\right)}{70a^5}+\frac{\left(-35a^4c^2d+35a^6c^3+21a^2cd^2-5d^3\right)\log\left(a^2x^2+1\right)}{70a^7}+\frac{d^2x^4\left(21a^2c-5d\right)}{140a^3}+c^2dx^3\cot^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x^2)^3*ArcCot[a*x],x]
```


```
[Out] (d*(35*a^4*c^2 - 21*a^2*c*d + 5*d^2)*x^2)/(70*a^5) + ((21*a^2*c - 5*d)*d^2*
x^4)/(140*a^3) + (d^3*x^6)/(42*a) + c^3*x*ArcCot[a*x] + c^2*d*x^3*ArcCot[a*
x] + (3*c*d^2*x^5*ArcCot[a*x])/5 + (d^3*x^7*ArcCot[a*x])/7 + ((35*a^6*c^3 -
 35*a^4*c^2*d + 21*a^2*c*d^2 - 5*d^3)*Log[1 + a^2*x^2])/(70*a^7)
```


Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \left(c+dx^2\right)^3 \cot^{-1}(ax)\,dx = c^3x\cot^{-1}(ax)+c^2dx^3\cot^{-1}(ax)+\frac{3}{5}cd^2x^5\cot^{-1}(ax)+\frac{1}{7}d^3x^7\cot^{-1}(ax)+a\int \frac{c^3x+c^2dx^3 -}{1+}$$

$$= c^3x\cot^{-1}(ax)+c^2dx^3\cot^{-1}(ax)+\frac{3}{5}cd^2x^5\cot^{-1}(ax)+\frac{1}{7}d^3x^7\cot^{-1}(ax)+a\int\left(\frac{d\left(35a^4c^2-\right.}{3}\right.$$

$$= \frac{d\left(35a^4c^2-21a^2cd+5d^2\right)x^2}{70a^5}+\frac{\left(21a^2c-5d\right)d^2x^4}{140a^3}+\frac{d^3x^6}{42a}+c^3x\cot^{-1}(ax)+c^2dx^3\cot^{-1}(ax$$

$$= \frac{d\left(35a^4c^2-21a^2cd+5d^2\right)x^2}{70a^5}+\frac{\left(21a^2c-5d\right)d^2x^4}{140a^3}+\frac{d^3x^6}{42a}+c^3x\cot^{-1}(ax)+c^2dx^3\cot^{-1}(ax$$

Mathematica [A] time = 0.103544, size = 149, normalized size = 0.89

$$\frac{a^2dx^2\left(a^4\left(210c^2+63cdx^2+10d^2x^4\right)-3a^2d\left(42c+5dx^2\right)+30d^2\right)+6\left(-35a^4c^2d+35a^6c^3+21a^2cd^2-5d^3\right)\log\left(a^2x^2+\right.}{420a^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x^2)^3*ArcCot[a*x],x]
```

```
[Out] (a^2*d*x^2*(30*d^2 - 3*a^2*d*(42*c + 5*d*x^2) + a^4*(210*c^2 + 63*c*d*x^2 +
 10*d^2*x^4)) + 12*a^7*x*(35*c^3 + 35*c^2*d*x^2 + 21*c*d^2*x^4 + 5*d^3*x^6)
*ArcCot[a*x] + 6*(35*a^6*c^3 - 35*a^4*c^2*d + 21*a^2*c*d^2 - 5*d^3)*Log[1 +
 a^2*x^2])/(420*a^7)
```

Maple [A] time = 0.043, size = 191, normalized size = 1.1

$$\frac{d^3x^7\operatorname{arccot}(ax)}{7}+\frac{3\,cd^2x^5\operatorname{arccot}(ax)}{5}+c^2dx^3\operatorname{arccot}(ax)+c^3x\operatorname{arccot}(ax)+\frac{c^2dx^2}{2\,a}+\frac{3\,cx^4d^2}{20\,a}+\frac{d^3x^6}{42\,a}-\frac{3\,cd^2x^2}{10\,a^3}-\frac{d^3x^4}{28\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x^2+c)^3*arccot(a*x),x)
```

```
[Out] 1/7*d^3*x^7*arccot(a*x)+3/5*c*d^2*x^5*arccot(a*x)+c^2*d*x^3*arccot(a*x)+c^3
*x*arccot(a*x)+1/2*c^2*d*x^2/a+3/20/a*x^4*c*d^2+1/42*d^3*x^6/a-3/10/a^3*c*d
^2*x^2-1/28/a^3*d^3*x^4+1/14/a^5*d^3*x^2+1/2/a*ln(a^2*x^2+1)*c^3-1/2/a^3*ln
(a^2*x^2+1)*c^2*d+3/10/a^5*ln(a^2*x^2+1)*c*d^2-1/14/a^7*ln(a^2*x^2+1)*d^3
```

Maxima [A] time = 0.971695, size = 215, normalized size = 1.28

$$\frac{1}{420}\,a\left(\frac{10\,a^4d^3x^6+3\left(21\,a^4cd^2-5\,a^2d^3\right)x^4+6\left(35\,a^4c^2d-21\,a^2cd^2+5\,d^3\right)x^2}{a^6}+\frac{6\left(35\,a^6c^3-35\,a^4c^2d+21\,a^2cd^2-5\,d^3\right)}{a^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^3*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/420*a*((10*a^4*d^3*x^6 + 3*(21*a^4*c*d^2 - 5*a^2*d^3)*x^4 + 6*(35*a^4*c^2
*d - 21*a^2*c*d^2 + 5*d^3)*x^2)/a^6 + 6*(35*a^6*c^3 - 35*a^4*c^2*d + 21*a^2
*c*d^2 - 5*d^3)*log(a^2*x^2 + 1)/a^8) + 1/35*(5*d^3*x^7 + 21*c*d^2*x^5 + 35
*c^2*d*x^3 + 35*c^3*x)*arccot(a*x)
```

Fricas [A] time = 1.83765, size = 366, normalized size = 2.18

$$\frac{10\,a^6d^3x^6+3\left(21\,a^6cd^2-5\,a^4d^3\right)x^4+6\left(35\,a^6c^2d-21\,a^4cd^2+5\,a^2d^3\right)x^2+12\left(5\,a^7d^3x^7+21\,a^7cd^2x^5+35\,a^7c^2dx^3+35\right.}{420\,a^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^3*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/420*(10*a^6*d^3*x^6 + 3*(21*a^6*c*d^2 - 5*a^4*d^3)*x^4 + 6*(35*a^6*c^2*d
- 21*a^4*c*d^2 + 5*a^2*d^3)*x^2 + 12*(5*a^7*d^3*x^7 + 21*a^7*c*d^2*x^5 + 35
*a^7*c^2*d*x^3 + 35*a^7*c^3*x)*arccot(a*x) + 6*(35*a^6*c^3 - 35*a^4*c^2*d +
 21*a^2*c*d^2 - 5*d^3)*log(a^2*x^2 + 1))/a^7
```

Sympy [A] time = 3.53637, size = 243, normalized size = 1.45

$$\begin{cases} c^3x\operatorname{acot}(ax)+c^2dx^3\operatorname{acot}(ax)+\frac{3cd^2x^5\operatorname{acot}(ax)}{5}+\frac{d^3x^7\operatorname{acot}(ax)}{7}+\frac{c^3\log\left(x^2+\frac{1}{a^2}\right)}{2a}+\frac{c^2dx^2}{2a}+\frac{3cd^2x^4}{20a}+\frac{d^3x^6}{42a}-\frac{c^2d\log\left(x^2+\frac{1}{a^2}\right)}{2a^3}-\frac{3cd^2 \ldots}{10a \ldots} \\ \frac{\pi\left(c^3x+c^2dx^3+\frac{3cd^2x^5}{5}+\frac{d^3x^7}{7}\right)}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x**2+c)**3*acot(a*x),x)
```

```
[Out] Piecewise((c**3*x*acot(a*x) + c**2*d*x**3*acot(a*x) + 3*c*d**2*x**5*acot(a*
x)/5 + d**3*x**7*acot(a*x)/7 + c**3*log(x**2 + a**(-2))/(2*a) + c**2*d*x**2
/(2*a) + 3*c*d**2*x**4/(20*a) + d**3*x**6/(42*a) - c**2*d*log(x**2 + a**(-2
))/(2*a**3) - 3*c*d**2*x**2/(10*a**3) - d**3*x**4/(28*a**3) + 3*c*d**2*log(
x**2 + a**(-2))/(10*a**5) + d**3*x**2/(14*a**5) - d**3*log(x**2 + a**(-2))/
(14*a**7), Ne(a, 0)), (pi*(c**3*x + c**2*d*x**3 + 3*c*d**2*x**5/5 + d**3*x*
*7/7)/2, True))
```

Giac [A] time = 1.13143, size = 221, normalized size = 1.32

$$\frac{1}{35}\left(5\,d^3x^7+21\,cd^2x^5+35\,c^2dx^3+35\,c^3x\right)\arctan\left(\frac{1}{ax}\right)+\frac{10\,a^5d^3x^6+63\,a^5cd^2x^4+210\,a^5c^2dx^2-15\,a^3d^3x^4-126\,a^3cd^2 \ldots}{420\,a^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^3*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/35*(5*d^3*x^7 + 21*c*d^2*x^5 + 35*c^2*d*x^3 + 35*c^3*x)*arctan(1/(a*x)) +
 1/420*(10*a^5*d^3*x^6 + 63*a^5*c*d^2*x^4 + 210*a^5*c^2*d*x^2 - 15*a^3*d^3*
x^4 - 126*a^3*c*d^2*x^2 + 30*a*d^3*x^2)/a^6 + 1/70*(35*a^6*c^3 - 35*a^4*c^2
*d + 21*a^2*c*d^2 - 5*d^3)*log(a^2*x^2 + 1)/a^7
```

3.55 $\int \left(c+dx^2\right)^2 \cot^{-1}(ax)\,dx$

Optimal. Leaf size=109

$$\frac{\left(15a^4c^2-10a^2cd+3d^2\right)\log\left(a^2x^2+1\right)}{30a^5}+\frac{dx^2\left(10a^2c-3d\right)}{30a^3}+c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{d^2x^4}{20a}+\frac{1}{5}d^2x^5\cot^{-1}(a$$

```
[Out] ((10*a^2*c - 3*d)*d*x^2)/(30*a^3) + (d^2*x^4)/(20*a) + c^2*x*ArcCot[a*x] +
(2*c*d*x^3*ArcCot[a*x])/3 + (d^2*x^5*ArcCot[a*x])/5 + ((15*a^4*c^2 - 10*a^2
*c*d + 3*d^2)*Log[1 + a^2*x^2])/(30*a^5)
```

Rubi [A] time = 0.126527, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {194, 4913, 1594, 1247, 698}

$$\frac{\left(15a^4c^2-10a^2cd+3d^2\right)\log\left(a^2x^2+1\right)}{30a^5}+\frac{dx^2\left(10a^2c-3d\right)}{30a^3}+c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{d^2x^4}{20a}+\frac{1}{5}d^2x^5\cot^{-1}(a$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x^2)^2*ArcCot[a*x],x]
```

```
[Out] ((10*a^2*c - 3*d)*d*x^2)/(30*a^3) + (d^2*x^4)/(20*a) + c^2*x*ArcCot[a*x] +
(2*c*d*x^3*ArcCot[a*x])/3 + (d^2*x^5*ArcCot[a*x])/5 + ((15*a^4*c^2 - 10*a^2
*c*d + 3*d^2)*Log[1 + a^2*x^2])/(30*a^5)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 1594

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.) + (c_.)*(x_)^(r_.))^(n_.), x
_Symbol] :> Int[u*x^(n*p)*(a + b*x^(q - p) + c*x^(r - p))^n, x] /; FreeQ[{a
```

```
, b, c, p, q, r}, x] && IntegerQ[n] && PosQ[q - p] && PosQ[r - p]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rubi steps

$$\int \left(c+dx^2\right)^2 \cot^{-1}(ax)\,dx = c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{1}{5}d^2x^5\cot^{-1}(ax)+a\int \frac{c^2x+\frac{2}{3}cdx^3+\frac{d^2x^5}{5}}{1+a^2x^2}\,dx$$

$$= c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{1}{5}d^2x^5\cot^{-1}(ax)+a\int \frac{x\left(c^2+\frac{2}{3}cdx^2+\frac{d^2x^4}{5}\right)}{1+a^2x^2}\,dx$$

$$= c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{1}{5}d^2x^5\cot^{-1}(ax)+\frac{1}{2}a\,\text{Subst}\left(\int \frac{c^2+\frac{2cdx}{3}+\frac{d^2x^2}{5}}{1+a^2x}\,dx, x, x$$

$$= c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{1}{5}d^2x^5\cot^{-1}(ax)+\frac{1}{2}a\,\text{Subst}\left(\int\left(\frac{\left(10a^2c-3d\right)d}{15a^4}+\frac{d^2x}{5a^2}\right.\right.$$

$$= \frac{\left(10a^2c-3d\right)dx^2}{30a^3}+\frac{d^2x^4}{20a}+c^2x\cot^{-1}(ax)+\frac{2}{3}cdx^3\cot^{-1}(ax)+\frac{1}{5}d^2x^5\cot^{-1}(ax)+\frac{\left(15a^4c^2-\right.}{}$$

Mathematica [A] time = 0.0659073, size = 97, normalized size = 0.89

$$\frac{\left(30a^4c^2-20a^2cd+6d^2\right)\log\left(a^2x^2+1\right)+4a^5x\cot^{-1}(ax)\left(15c^2+10cdx^2+3d^2x^4\right)+a^2dx^2\left(a^2\left(20c+3dx^2\right)-6d\right)}{60a^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x^2)^2*ArcCot[a*x],x]
```

```
[Out] (a^2*d*x^2*(-6*d + a^2*(20*c + 3*d*x^2)) + 4*a^5*x*(15*c^2 + 10*c*d*x^2 + 3
*d^2*x^4)*ArcCot[a*x] + (30*a^4*c^2 - 20*a^2*c*d + 6*d^2)*Log[1 + a^2*x^2])
/(60*a^5)
```

Maple [A] time = 0.042, size = 119, normalized size = 1.1

$$\frac{d^2x^5\operatorname{arccot}(ax)}{5}+\frac{2\,cdx^3\operatorname{arccot}(ax)}{3}+c^2x\operatorname{arccot}(ax)+\frac{dcx^2}{3\,a}+\frac{d^2x^4}{20\,a}-\frac{d^2x^2}{10\,a^3}+\frac{\ln\left(a^2x^2+1\right)c^2}{2\,a}-\frac{\ln\left(a^2x^2+1\right)cd}{3\,a^3}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x^2+c)^2*arccot(a*x),x)
```

```
[Out] 1/5*d^2*x^5*arccot(a*x)+2/3*c*d*x^3*arccot(a*x)+c^2*x*arccot(a*x)+1/3/a*d*c
*x^2+1/20*d^2*x^4/a-1/10/a^3*x^2*d^2+1/2/a*ln(a^2*x^2+1)*c^2-1/3/a^3*ln(a^2
*x^2+1)*c*d+1/10/a^5*ln(a^2*x^2+1)*d^2
```

Maxima [A] time = 1.01283, size = 139, normalized size = 1.28

$$\frac{1}{60}\,a\left(\frac{3\,a^2d^2x^4+2\left(10\,a^2cd-3\,d^2\right)x^2}{a^4}+\frac{2\left(15\,a^4c^2-10\,a^2cd+3\,d^2\right)\log\left(a^2x^2+1\right)}{a^6}\right)+\frac{1}{15}\left(3\,d^2x^5+10\,cdx^3+15\,c^2x\right)\operatorname{arc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^2*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/60*a*((3*a^2*d^2*x^4 + 2*(10*a^2*c*d - 3*d^2)*x^2)/a^4 + 2*(15*a^4*c^2 -
10*a^2*c*d + 3*d^2)*log(a^2*x^2 + 1)/a^6) + 1/15*(3*d^2*x^5 + 10*c*d*x^3 +
15*c^2*x)*arccot(a*x)
```

Fricas [A] time = 1.92299, size = 240, normalized size = 2.2

$$\frac{3\,a^4d^2x^4+2\left(10\,a^4cd-3\,a^2d^2\right)x^2+4\left(3\,a^5d^2x^5+10\,a^5cdx^3+15\,a^5c^2x\right)\operatorname{arccot}(ax)+2\left(15\,a^4c^2-10\,a^2cd+3\,d^2\right)\log\left(a\right.}{60\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^2*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/60*(3*a^4*d^2*x^4 + 2*(10*a^4*c*d - 3*a^2*d^2)*x^2 + 4*(3*a^5*d^2*x^5 + 1
0*a^5*c*d*x^3 + 15*a^5*c^2*x)*arccot(a*x) + 2*(15*a^4*c^2 - 10*a^2*c*d + 3*
d^2)*log(a^2*x^2 + 1))/a^5
```

Sympy [A] time = 1.93479, size = 151, normalized size = 1.39

$$\begin{cases} c^2x\operatorname{acot}(ax) + \frac{2cdx^3\operatorname{acot}(ax)}{3} + \frac{d^2x^5\operatorname{acot}(ax)}{5} + \frac{c^2\log\left(x^2+\frac{1}{a^2}\right)}{2a} + \frac{cdx^2}{3a} + \frac{d^2x^4}{20a} - \frac{cd\log\left(x^2+\frac{1}{a^2}\right)}{3a^3} - \frac{d^2x^2}{10a^3} + \frac{d^2\log\left(x^2+\frac{1}{a^2}\right)}{10a^5} & \text{for } a \neq 0 \\ \frac{\pi\left(c^2x+\frac{2cdx^3}{3}+\frac{d^2x^5}{5}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x**2+c)**2*acot(a*x),x)
```

```
[Out] Piecewise((c**2*x*acot(a*x) + 2*c*d*x**3*acot(a*x)/3 + d**2*x**5*acot(a*x)/
5 + c**2*log(x**2 + a**(-2))/(2*a) + c*d*x**2/(3*a) + d**2*x**4/(20*a) - c*
d*log(x**2 + a**(-2))/(3*a**3) - d**2*x**2/(10*a**3) + d**2*log(x**2 + a**(
-2))/(10*a**5), Ne(a, 0)), (pi*(c**2*x + 2*c*d*x**3/3 + d**2*x**5/5)/2, Tru
e))
```

Giac [A] time = 1.11553, size = 142, normalized size = 1.3

$$\frac{1}{15}\left(3\,d^2x^5+10\,cdx^3+15\,c^2x\right)\arctan\left(\frac{1}{ax}\right)+\frac{3\,a^3d^2x^4+20\,a^3cdx^2-6\,ad^2x^2}{60\,a^4}+\frac{\left(15\,a^4c^2-10\,a^2cd+3\,d^2\right)\log\left(a^2x^2+1\right)}{30\,a^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^2*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/15*(3*d^2*x^5 + 10*c*d*x^3 + 15*c^2*x)*arctan(1/(a*x)) + 1/60*(3*a^3*d^2*
x^4 + 20*a^3*c*d*x^2 - 6*a*d^2*x^2)/a^4 + 1/30*(15*a^4*c^2 - 10*a^2*c*d + 3
*d^2)*log(a^2*x^2 + 1)/a^5
```

3.56 $\int \left(c+dx^2\right)\cot^{-1}(ax)\,dx$

Optimal. Leaf size=58

$$\frac{\left(3a^2c-d\right)\log\left(a^2x^2+1\right)}{6a^3}+cx\cot^{-1}(ax)+\frac{dx^2}{6a}+\frac{1}{3}dx^3\cot^{-1}(ax)$$

```
[Out] (d*x^2)/(6*a) + c*x*ArcCot[a*x] + (d*x^3*ArcCot[a*x])/3 + ((3*a^2*c - d)*Lo
g[1 + a^2*x^2])/(6*a^3)
```

Rubi [A] time = 0.061042, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4913, 1593, 444, 43}

$$\frac{\left(3a^2c-d\right)\log\left(a^2x^2+1\right)}{6a^3}+cx\cot^{-1}(ax)+\frac{dx^2}{6a}+\frac{1}{3}dx^3\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x^2)*ArcCot[a*x],x]
```

```
[Out] (d*x^2)/(6*a) + c*x*ArcCot[a*x] + (d*x^3*ArcCot[a*x])/3 + ((3*a^2*c - d)*Lo
g[1 + a^2*x^2])/(6*a^3)
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
```

```
1, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int \left(c+dx^2\right)\cot^{-1}(ax)\,dx &= cx\cot^{-1}(ax)+\frac{1}{3}dx^3\cot^{-1}(ax)+a\int\frac{cx+\frac{dx^3}{3}}{1+a^2x^2}\,dx\\
&= cx\cot^{-1}(ax)+\frac{1}{3}dx^3\cot^{-1}(ax)+a\int\frac{x\left(c+\frac{dx^2}{3}\right)}{1+a^2x^2}\,dx\\
&= cx\cot^{-1}(ax)+\frac{1}{3}dx^3\cot^{-1}(ax)+\frac{1}{2}a\,\text{Subst}\left(\int\frac{c+\frac{dx}{3}}{1+a^2x}\,dx,x,x^2\right)\\
&= cx\cot^{-1}(ax)+\frac{1}{3}dx^3\cot^{-1}(ax)+\frac{1}{2}a\,\text{Subst}\left(\int\left(\frac{d}{3a^2}+\frac{3a^2c-d}{3a^2\left(1+a^2x\right)}\right)dx,x,x^2\right)\\
&= \frac{dx^2}{6a}+cx\cot^{-1}(ax)+\frac{1}{3}dx^3\cot^{-1}(ax)+\frac{\left(3a^2c-d\right)\log\left(1+a^2x^2\right)}{6a^3}
\end{aligned}$$

Mathematica [A] time = 0.0089964, size = 67, normalized size = 1.16

$$\frac{c\log\left(a^2x^2+1\right)}{2a}-\frac{d\log\left(a^2x^2+1\right)}{6a^3}+cx\cot^{-1}(ax)+\frac{dx^2}{6a}+\frac{1}{3}dx^3\cot^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x^2)*ArcCot[a*x],x]
```

```
[Out] (d*x^2)/(6*a) + c*x*ArcCot[a*x] + (d*x^3*ArcCot[a*x])/3 + (c*Log[1 + a^2*x^
2])/(2*a) - (d*Log[1 + a^2*x^2])/(6*a^3)
```

Maple [A] time = 0.04, size = 60, normalized size = 1.

$$\frac{dx^3\text{arccot}\,(ax)}{3}+cx\text{arccot}\,(ax)+\frac{dx^2}{6\,a}+\frac{\ln\left(a^2x^2+1\right)c}{2\,a}-\frac{\ln\left(a^2x^2+1\right)d}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x^2+c)*arccot(a*x),x)
```

```
[Out] 1/3*d*x^3*arccot(a*x)+c*x*arccot(a*x)+1/6*d*x^2/a+1/2/a*ln(a^2*x^2+1)*c-1/6
/a^3*ln(a^2*x^2+1)*d
```

Maxima [A] time = 0.953438, size = 72, normalized size = 1.24

$$\frac{1}{6}\,a\left(\frac{dx^2}{a^2} + \frac{\left(3\,a^2c - d\right)\log\left(a^2x^2 + 1\right)}{a^4}\right) + \frac{1}{3}\left(dx^3 + 3\,cx\right)\operatorname{arccot}\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)*arccot(a*x),x, algorithm="maxima")
```

```
[Out] 1/6*a*(d*x^2/a^2 + (3*a^2*c - d)*log(a^2*x^2 + 1)/a^4) + 1/3*(d*x^3 + 3*c*x
)*arccot(a*x)
```

Fricas [A] time = 2.14745, size = 127, normalized size = 2.19

$$\frac{a^2dx^2 + 2\left(a^3dx^3 + 3\,a^3cx\right)\operatorname{arccot}\left(ax\right) + \left(3\,a^2c - d\right)\log\left(a^2x^2 + 1\right)}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)*arccot(a*x),x, algorithm="fricas")
```

```
[Out] 1/6*(a^2*d*x^2 + 2*(a^3*d*x^3 + 3*a^3*c*x)*arccot(a*x) + (3*a^2*c - d)*log(
a^2*x^2 + 1))/a^3
```

Sympy [A] time = 0.836268, size = 73, normalized size = 1.26

$$\begin{cases} cx\operatorname{acot}\left(ax\right) + \frac{dx^3\operatorname{acot}\left(ax\right)}{3} + \frac{c\log\left(x^2+\frac{1}{a^2}\right)}{2a} + \frac{dx^2}{6a} - \frac{d\log\left(x^2+\frac{1}{a^2}\right)}{6a^3} & \text{for}\ a \neq 0 \\ \frac{\pi\left(cx+\frac{dx^3}{3}\right)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x**2+c)*acot(a*x),x)
```

```
[Out] Piecewise((c*x*acot(a*x) + d*x**3*acot(a*x)/3 + c*log(x**2 + a**(-2))/(2*a)
 + d*x**2/(6*a) - d*log(x**2 + a**(-2))/(6*a**3), Ne(a, 0)), (pi*(c*x + d*x
**3/3)/2, True))
```

Giac [A] time = 1.10448, size = 74, normalized size = 1.28

$$\frac{dx^2}{6\,a} + \frac{1}{3}\left(dx^3 + 3\,cx\right)\arctan\left(\frac{1}{ax}\right) + \frac{\left(3\,a^2c - d\right)\log\left(a^2x^2 + 1\right)}{6\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)*arccot(a*x),x, algorithm="giac")
```

```
[Out] 1/6*d*x^2/a + 1/3*(d*x^3 + 3*c*x)*arctan(1/(a*x)) + 1/6*(3*a^2*c - d)*log(a
^2*x^2 + 1)/a^3
```

3.57 $\int \frac{\cot^{-1}(ax)}{c+dx^2}\,dx$

Optimal. Leaf size=403

$$-\frac{\text{PolyLog}\left(2,1-\frac{2i\sqrt{c}\sqrt{d}(-ax+i)}{\left(a\sqrt{c}-\sqrt{d}\right)\left(\sqrt{c}-i\sqrt{d}x\right)}\right)}{4\sqrt{c}\sqrt{d}}+\frac{\text{PolyLog}\left(2,1+\frac{2i\sqrt{c}\sqrt{d}(ax+i)}{\left(a\sqrt{c}+\sqrt{d}\right)\left(\sqrt{c}-i\sqrt{d}x\right)}\right)}{4\sqrt{c}\sqrt{d}}+\frac{i\log\left(1-\frac{i}{ax}\right)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2\sqrt{c}\sqrt{d}}-\frac{i\log\left(1+\frac{i}{ax}\right)\ldots}{2\sqrt{\ldots}}$$

```
[Out] ((I/2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*Log[1 - I/(a*x)])/(Sqrt[c]*Sqrt[d]) - ((
I/2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*Log[1 + I/(a*x)])/(Sqrt[c]*Sqrt[d]) - ((I/
2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*Log[((2*I)*Sqrt[c]*Sqrt[d]*(I - a*x))/((a*Sq
rt[c] - Sqrt[d])*(Sqrt[c] - I*Sqrt[d]*x))])/(Sqrt[c]*Sqrt[d]) + ((I/2)*ArcT
an[(Sqrt[d]*x)/Sqrt[c]]*Log[((-2*I)*Sqrt[c]*Sqrt[d]*(I + a*x))/((a*Sqrt[c]
+ Sqrt[d])*(Sqrt[c] - I*Sqrt[d]*x))])/(Sqrt[c]*Sqrt[d]) - PolyLog[2, 1 - ((
2*I)*Sqrt[c]*Sqrt[d]*(I - a*x))/((a*Sqrt[c] - Sqrt[d])*(Sqrt[c] - I*Sqrt[d]
*x))]/(4*Sqrt[c]*Sqrt[d]) + PolyLog[2, 1 + ((2*I)*Sqrt[c]*Sqrt[d]*(I + a*x)
)/((a*Sqrt[c] + Sqrt[d])*(Sqrt[c] - I*Sqrt[d]*x))]/(4*Sqrt[c]*Sqrt[d])
```

Rubi [A] time = 0.919218, antiderivative size = 403, normalized size of antiderivative = 1., number of steps used = 27, number of rules used = 13, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.929, Rules used = {4909, 205, 2470, 12, 260, 6688, 4876, 4848, 2391, 4856, 2402, 2315, 2447}

$$-\frac{\text{PolyLog}\left(2,1-\frac{2i\sqrt{c}\sqrt{d}(-ax+i)}{\left(a\sqrt{c}-\sqrt{d}\right)\left(\sqrt{c}-i\sqrt{d}x\right)}\right)}{4\sqrt{c}\sqrt{d}}+\frac{\text{PolyLog}\left(2,1+\frac{2i\sqrt{c}\sqrt{d}(ax+i)}{\left(a\sqrt{c}+\sqrt{d}\right)\left(\sqrt{c}-i\sqrt{d}x\right)}\right)}{4\sqrt{c}\sqrt{d}}+\frac{i\log\left(1-\frac{i}{ax}\right)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2\sqrt{c}\sqrt{d}}-\frac{i\log\left(1+\frac{i}{ax}\right)\ldots}{2\sqrt{\ldots}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/(c + d*x^2),x]
```

```
[Out] ((I/2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*Log[1 - I/(a*x)])/(Sqrt[c]*Sqrt[d]) - ((
I/2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*Log[1 + I/(a*x)])/(Sqrt[c]*Sqrt[d]) - ((I/
2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*Log[((2*I)*Sqrt[c]*Sqrt[d]*(I - a*x))/((a*Sq
rt[c] - Sqrt[d])*(Sqrt[c] - I*Sqrt[d]*x))])/(Sqrt[c]*Sqrt[d]) + ((I/2)*ArcT
an[(Sqrt[d]*x)/Sqrt[c]]*Log[((-2*I)*Sqrt[c]*Sqrt[d]*(I + a*x))/((a*Sqrt[c]
+ Sqrt[d])*(Sqrt[c] - I*Sqrt[d]*x))])/(Sqrt[c]*Sqrt[d]) - PolyLog[2, 1 - ((
2*I)*Sqrt[c]*Sqrt[d]*(I - a*x))/((a*Sqrt[c] - Sqrt[d])*(Sqrt[c] - I*Sqrt[d]
*x))]/(4*Sqrt[c]*Sqrt[d]) + PolyLog[2, 1 + ((2*I)*Sqrt[c]*Sqrt[d]*(I + a*x)
)/((a*Sqrt[c] + Sqrt[d])*(Sqrt[c] - I*Sqrt[d]*x))]/(4*Sqrt[c]*Sqrt[d])
```

Rule 4909

```
Int[ArcCot[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I/(c*x)]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I/(c*x)]/(d + e
*x^2), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2470

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))/((f_) + (g_.)
*(x_)^2), x_Symbol] :> With[{u = IntHide[1/(f + g*x^2), x]}, Simp[u*(a + b*
Log[c*(d + e*x^n)^p]), x] - Dist[b*e*n*p, Int[(u*x^(n - 1))/(d + e*x^n), x]
, x]] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && IntegerQ[n]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
```

```
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)}{c+dx^2}\,dx = \frac{1}{2}i\int \frac{\log\left(1-\frac{i}{ax}\right)}{c+dx^2}\,dx - \frac{1}{2}i\int \frac{\log\left(1+\frac{i}{ax}\right)}{c+dx^2}\,dx$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{\sqrt{c}\sqrt{d}\left(1-\frac{i}{ax}\right)x^2}\,dx}{2a} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{\sqrt{c}\sqrt{d}\left(1+\frac{i}{ax}\right)x^2}\,dx}{2a}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{\left(1-\frac{i}{ax}\right)x^2}\,dx}{2a\sqrt{c}\sqrt{d}} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{\left(1+\frac{i}{ax}\right)x^2}\,dx}{2a\sqrt{c}\sqrt{d}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} + \frac{\int \frac{a\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{x(-i+ax)}\,dx}{2a\sqrt{c}\sqrt{d}} + \frac{\int \frac{a\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{x(i+ax)}\,dx}{2a\sqrt{c}\sqrt{d}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{x(-i+ax)}\,dx}{2\sqrt{c}\sqrt{d}} + \frac{\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{x(i+ax)}\,dx}{2\sqrt{c}\sqrt{d}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} + \frac{\int \left(\frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{x} - \frac{ia\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{-i+ax}\right)dx}{2\sqrt{c}\sqrt{d}} + \frac{\int \left(-\frac{i\,\mathrm{ta}\ldots}{}\right.}{}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{(ia)\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{-i+ax}\,dx}{2\sqrt{c}\sqrt{d}} + \frac{(ia)\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{i+ax}\,dx}{2\sqrt{c}\sqrt{d}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(\frac{2i\sqrt{c}\sqrt{d}(i-ax)}{\left(a\sqrt{c}-\sqrt{d}\right)\left(\sqrt{c}-i\sqrt{d}x\right)}\right)}{2\sqrt{c}\sqrt{d}} + \frac{i\,\mathrm{tan}\ldots}{}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1-\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(1+\frac{i}{ax}\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\log\left(\frac{2i\sqrt{c}\sqrt{d}(i-ax)}{\left(a\sqrt{c}-\sqrt{d}\right)\left(\sqrt{c}-i\sqrt{d}x\right)}\right)}{2\sqrt{c}\sqrt{d}} + \frac{i\,\mathrm{tan}\ldots}{}$$

<u>Mathematica</u> [A] time = 0.293219, size = 523, normalized size = 1.3

$$\frac{i\left(-\mathrm{PolyLog}\left(2,\frac{a\left(\sqrt{-c}-\sqrt{d}x\right)}{a\sqrt{-c}-i\sqrt{d}}\right)+\mathrm{PolyLog}\left(2,\frac{a\left(\sqrt{-c}-\sqrt{d}x\right)}{a\sqrt{-c}+i\sqrt{d}}\right)-\mathrm{PolyLog}\left(2,\frac{a\left(\sqrt{-c}+\sqrt{d}x\right)}{a\sqrt{-c}-i\sqrt{d}}\right)+\mathrm{PolyLog}\left(2,\frac{a\left(\sqrt{-c}+\sqrt{d}x\right)}{a\sqrt{-c}+i\sqrt{d}}\right)+\log\left(1-\ldots\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]/(c + d*x^2),x]
```

```
[Out] ((I/4)*(Log[1 - I/(a*x)]*Log[Sqrt[-c] - Sqrt[d]*x] - Log[1 + I/(a*x)]*Log[S
qrt[-c] - Sqrt[d]*x] - Log[(Sqrt[d]*(-I + a*x))/(a*Sqrt[-c] - I*Sqrt[d])]*L
og[Sqrt[-c] - Sqrt[d]*x] + Log[(Sqrt[d]*(I + a*x))/(a*Sqrt[-c] + I*Sqrt[d])
]*Log[Sqrt[-c] - Sqrt[d]*x] - Log[1 - I/(a*x)]*Log[Sqrt[-c] + Sqrt[d]*x] +
Log[1 + I/(a*x)]*Log[Sqrt[-c] + Sqrt[d]*x] + Log[(Sqrt[d]*(I - a*x))/(a*Sqr
t[-c] + I*Sqrt[d])]*Log[Sqrt[-c] + Sqrt[d]*x] - Log[-((Sqrt[d]*(I + a*x))/(
a*Sqrt[-c] - I*Sqrt[d]))]*Log[Sqrt[-c] + Sqrt[d]*x] - PolyLog[2, (a*(Sqrt[-
c] - Sqrt[d]*x))/(a*Sqrt[-c] - I*Sqrt[d])] + PolyLog[2, (a*(Sqrt[-c] - Sqrt
[d]*x))/(a*Sqrt[-c] + I*Sqrt[d])] - PolyLog[2, (a*(Sqrt[-c] + Sqrt[d]*x))/(
a*Sqrt[-c] - I*Sqrt[d])] + PolyLog[2, (a*(Sqrt[-c] + Sqrt[d]*x))/(a*Sqrt[-c
] + I*Sqrt[d])]))/(Sqrt[-c]*Sqrt[d])
```

Maple [B] time = 0.264, size = 826, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c),x)
```

```
[Out] -1/2*I/a*(a^2*c*d)^(1/2)/c/d*arccot(a*x)*ln(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+
1)/(a^2*c+2*(a^2*c*d)^(1/2)+d))+1/2*a^3*arccot(a*x)^2/d/(a^4*c^2-2*a^2*c*d+
d^2)*(a^2*c*d)^(1/2)*c-a*arccot(a*x)^2/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1
/2)+1/2*I*a^3*ln(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)
+d))*arccot(a*x)/d/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)*c-I*a*ln(1-(a^2*
c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)+d))*arccot(a*x)/(a^4*c^
2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)+1/4*a^3*polylog(2,(a^2*c-d)*(a*x+I)^2/(a^2
*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)+d))/d/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1
/2)*c-1/2*a*polylog(2,(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1
/2)+d))/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)+1/2/a*arccot(a*x)^2/c/(a^4*
c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)*d+1/4/a*polylog(2,(a^2*c-d)*(a*x+I)^2/(a
^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)+d))/c/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^
(1/2)*d+1/2*I/a*ln(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/
2)+d))*arccot(a*x)/c/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)*d-1/2/a*(a^2*c
*d)^(1/2)/c/d*arccot(a*x)^2-1/4/a*(a^2*c*d)^(1/2)/c/d*polylog(2,(a^2*c-d)*(
a*x+I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c*d)^(1/2)+d))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)}{dx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)/(d*x^2 + c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{acot}(ax)}{c+dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c),x)
```

```
[Out] Integral(acot(a*x)/(c + d*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{arccot}(ax)}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)/(d*x^2 + c), x)
```

3.58 $\int \frac{\cot^{-1}(ax)}{(c+dx^2)^2} dx$

Optimal. Leaf size=801

$$\frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\cot^{-1}(ax)}{2c^{3/2}\sqrt{d}}+\frac{x\cot^{-1}(ax)}{2c\left(dx^2+c\right)}-\frac{ia\log\left(\frac{\sqrt{d}\left(1-\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}+\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}}+\frac{ia\log\left(-\frac{\sqrt{d}\left(\sqrt{-a^2}x+1\right)}{i\sqrt{-a^2}\sqrt{c}-\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}}+\frac{ia\log}{}$$

```
[Out] (x*ArcCot[a*x])/(2*c*(c + d*x^2)) + (ArcCot[a*x]*ArcTan[(Sqrt[d]*x)/Sqrt[c]
])/(2*c^(3/2)*Sqrt[d]) - ((I/8)*a*Log[(Sqrt[d]*(1 - Sqrt[-a^2]*x))/(I*Sqrt[
-a^2]*Sqrt[c] + Sqrt[d])]*Log[1 - (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/
2)*Sqrt[d]) + ((I/8)*a*Log[-((Sqrt[d]*(1 + Sqrt[-a^2]*x))/(I*Sqrt[-a^2]*Sqr
t[c] - Sqrt[d]))]*Log[1 - (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[
d]) + ((I/8)*a*Log[-((Sqrt[d]*(1 - Sqrt[-a^2]*x))/(I*Sqrt[-a^2]*Sqrt[c] - S
qrt[d]))]*Log[1 + (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) - ((
I/8)*a*Log[(Sqrt[d]*(1 + Sqrt[-a^2]*x))/(I*Sqrt[-a^2]*Sqrt[c] + Sqrt[d])]*L
og[1 + (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) + (a*Log[1 + a^
2*x^2])/(4*c*(a^2*c - d)) - (a*Log[c + d*x^2])/(4*c*(a^2*c - d)) - ((I/8)*a
*PolyLog[2, (Sqrt[-a^2]*(Sqrt[c] - I*Sqrt[d]*x))/(Sqrt[-a^2]*Sqrt[c] - I*Sq
rt[d])]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) + ((I/8)*a*PolyLog[2, (Sqrt[-a^2]*(Sq
rt[c] - I*Sqrt[d]*x))/(Sqrt[-a^2]*Sqrt[c] + I*Sqrt[d])]])/(Sqrt[-a^2]*c^(3/2
)*Sqrt[d]) - ((I/8)*a*PolyLog[2, (Sqrt[-a^2]*(Sqrt[c] + I*Sqrt[d]*x))/(Sqrt
[-a^2]*Sqrt[c] - I*Sqrt[d])]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) + ((I/8)*a*PolyL
og[2, (Sqrt[-a^2]*(Sqrt[c] + I*Sqrt[d]*x))/(Sqrt[-a^2]*Sqrt[c] + I*Sqrt[d])
]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d])
```

Rubi [A] time = 1.15834, antiderivative size = 801, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 12, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.857, Rules used = {199, 205, 4913, 6725, 444, 36, 31, 4908, 2409, 2394, 2393, 2391}

$$\frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\cot^{-1}(ax)}{2c^{3/2}\sqrt{d}}+\frac{x\cot^{-1}(ax)}{2c\left(dx^2+c\right)}-\frac{ia\log\left(\frac{\sqrt{d}\left(1-\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}+\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}}+\frac{ia\log\left(-\frac{\sqrt{d}\left(\sqrt{-a^2}x+1\right)}{i\sqrt{-a^2}\sqrt{c}-\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}}+\frac{ia\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/(c + d*x^2)^2,x]
```


```
[Out] (x*ArcCot[a*x])/(2*c*(c + d*x^2)) + (ArcCot[a*x]*ArcTan[(Sqrt[d]*x)/Sqrt[c]
])/(2*c^(3/2)*Sqrt[d]) - ((I/8)*a*Log[(Sqrt[d]*(1 - Sqrt[-a^2]*x))/(I*Sqrt[
```

```
-a^2]*Sqrt[c] + Sqrt[d])]*Log[1 - (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/
2)*Sqrt[d]) + ((I/8)*a*Log[-((Sqrt[d]*(1 + Sqrt[-a^2]*x))/(I*Sqrt[-a^2]*Sqr
t[c] - Sqrt[d]))]*Log[1 - (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[
d]) + ((I/8)*a*Log[-((Sqrt[d]*(1 - Sqrt[-a^2]*x))/(I*Sqrt[-a^2]*Sqrt[c] - S
qrt[d]))]*Log[1 + (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) - ((
I/8)*a*Log[(Sqrt[d]*(1 + Sqrt[-a^2]*x))/(I*Sqrt[-a^2]*Sqrt[c] + Sqrt[d])]*L
og[1 + (I*Sqrt[d]*x)/Sqrt[c]])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) + (a*Log[1 + a^
2*x^2])/(4*c*(a^2*c - d)) - (a*Log[c + d*x^2])/(4*c*(a^2*c - d)) - ((I/8)*a
*PolyLog[2, (Sqrt[-a^2]*(Sqrt[c] - I*Sqrt[d]*x))/(Sqrt[-a^2]*Sqrt[c] - I*Sq
rt[d])])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) + ((I/8)*a*PolyLog[2, (Sqrt[-a^2]*(Sq
rt[c] - I*Sqrt[d]*x))/(Sqrt[-a^2]*Sqrt[c] + I*Sqrt[d])])/(Sqrt[-a^2]*c^(3/2
)*Sqrt[d]) - ((I/8)*a*PolyLog[2, (Sqrt[-a^2]*(Sqrt[c] + I*Sqrt[d]*x))/(Sqrt
[-a^2]*Sqrt[c] - I*Sqrt[d])])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d]) + ((I/8)*a*PolyL
og[2, (Sqrt[-a^2]*(Sqrt[c] + I*Sqrt[d]*x))/(Sqrt[-a^2]*Sqrt[c] + I*Sqrt[d])
])/(Sqrt[-a^2]*c^(3/2)*Sqrt[d])
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
```

```
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^2}\,dx = \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} + a\int \frac{\frac{x}{2c(c+dx^2)} + \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}}}{1+a^2x^2}\,dx$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} + a\int\left(\frac{x}{2c\left(1+a^2x^2\right)\left(c+dx^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}\left(1+a^2x^2\right)}\right)dx$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} + \frac{a\int \frac{x}{(1+a^2x^2)(c+dx^2)}\,dx}{2c} + \frac{a\int \frac{\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{1+a^2x^2}\,dx}{2c^{3/2}\sqrt{d}}$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} + \frac{a\,\mathrm{Subst}\left(\int \frac{1}{(1+a^2x)(c+dx)}\,dx, x, x^2\right)}{4c} + \frac{(ia)\int \frac{\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{1+a^2x^2}\,dx}{4c^{3/2}\sqrt{d}} - \cdots$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} + \frac{a^3\,\mathrm{Subst}\left(\int \frac{1}{1+a^2x}\,dx, x, x^2\right)}{4c\left(a^2c-d\right)} + \frac{(ia)\int\left(\frac{\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{2\left(1-\sqrt{-a^2}x\right)} + \frac{\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{2\left(1+\sqrt{-a^2}x\right)} \cdots\right.}{4c^{3/2}\sqrt{d}}$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} + \frac{a\log\left(1+a^2x^2\right)}{4c\left(a^2c-d\right)} - \frac{a\log\left(c+dx^2\right)}{4c\left(a^2c-d\right)} + \frac{(ia)\int \frac{\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{1-\sqrt{-a^2}x}\,dx}{8c^{3/2}\sqrt{d}} + \cdots$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} - \frac{ia\log\left(\frac{\sqrt{d}\left(1-\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}+\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}} + \frac{ia\log\left(-\frac{\sqrt{d}\left(1+\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}-\sqrt{d}}\right)\cdots}{8\sqrt{-a^2}c^{3/2}\cdots}$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} - \frac{ia\log\left(\frac{\sqrt{d}\left(1-\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}+\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}} + \frac{ia\log\left(-\frac{\sqrt{d}\left(1+\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}-\sqrt{d}}\right)\cdots}{8\sqrt{-a^2}c^{3/2}\cdots}$$

$$= \frac{x\cot^{-1}(ax)}{2c\left(c+dx^2\right)} + \frac{\cot^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)}{2c^{3/2}\sqrt{d}} - \frac{ia\log\left(\frac{\sqrt{d}\left(1-\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}+\sqrt{d}}\right)\log\left(1-\frac{i\sqrt{d}x}{\sqrt{c}}\right)}{8\sqrt{-a^2}c^{3/2}\sqrt{d}} + \frac{ia\log\left(-\frac{\sqrt{d}\left(1+\sqrt{-a^2}x\right)}{i\sqrt{-a^2}\sqrt{c}-\sqrt{d}}\right)\cdots}{8\sqrt{-a^2}c^{3/2}\cdots}$$

Mathematica [A] time = 7.30628, size = 802, normalized size = 1.

$$-\frac{a\left(\frac{2\log\left(1-\frac{(a^2c-d)\cos\left(2\cot^{-1}(ax)\right)}{ca^2+d}\right)}{a^2c-d}+\frac{2\cos^{-1}\left(\frac{ca^2+d}{a^2c-d}\right)\tanh^{-1}\left(\frac{ac}{\sqrt{-a^2cd}\,x}\right)+4\cot^{-1}(ax)\tanh^{-1}\left(\frac{adx}{\sqrt{-a^2cd}}\right)+\left(\cos^{-1}\left(\frac{ca^2+d}{a^2c-d}\right)-2i\tanh^{-1}\left(\frac{ac}{\sqrt{-a^2cd}\,x}\right)\right)\log\left(\frac{2id\left(ica^2\cdots\right.}{\left(a^2c-d\cdots\right.}\right.}{\cdots}\right)}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a*x]/(c + d*x^2)^2,x]
```

```
[Out] -(a*((2*Log[1 - ((a^2*c - d)*Cos[2*ArcCot[a*x]])/(a^2*c + d)])/(a^2*c - d)
+ (2*ArcCos[(a^2*c + d)/(a^2*c - d)]*ArcTanh[(a*c)/(Sqrt[-(a^2*c*d)]*x)] +
4*ArcCot[a*x]*ArcTanh[(a*d*x)/Sqrt[-(a^2*c*d)]] + (ArcCos[(a^2*c + d)/(a^2*
c - d)] - (2*I)*ArcTanh[(a*c)/(Sqrt[-(a^2*c*d)]*x)])*Log[((2*I)*d*(I*a^2*c
+ Sqrt[-(a^2*c*d)])*(I + a*x))/((a^2*c - d)*(Sqrt[-(a^2*c*d)] - a*d*x))] +
(ArcCos[(a^2*c + d)/(a^2*c - d)] + (2*I)*ArcTanh[(a*c)/(Sqrt[-(a^2*c*d)]*x)
])*Log[(2*d*(a^2*c + I*Sqrt[-(a^2*c*d)])*(-I + a*x))/((a^2*c - d)*(-Sqrt[-(
a^2*c*d)] + a*d*x))] - (ArcCos[(a^2*c + d)/(a^2*c - d)] + (2*I)*ArcTanh[(a*
c)/(Sqrt[-(a^2*c*d)]*x)] + (2*I)*ArcTanh[(a*d*x)/Sqrt[-(a^2*c*d)]])*Log[(Sq
rt[2]*Sqrt[-(a^2*c*d)])/(Sqrt[a^2*c - d]*E^(I*ArcCot[a*x])*Sqrt[-(a^2*c) -
d + (a^2*c - d)*Cos[2*ArcCot[a*x]]])] - (ArcCos[(a^2*c + d)/(a^2*c - d)] -
(2*I)*ArcTanh[(a*c)/(Sqrt[-(a^2*c*d)]*x)] - (2*I)*ArcTanh[(a*d*x)/Sqrt[-(a^
2*c*d)]])*Log[(Sqrt[2]*Sqrt[-(a^2*c*d)]*E^(I*ArcCot[a*x]))/(Sqrt[a^2*c - d]
*Sqrt[-(a^2*c) - d + (a^2*c - d)*Cos[2*ArcCot[a*x]]])] + I*(PolyLog[2, ((a^
2*c + d - (2*I)*Sqrt[-(a^2*c*d)])*(Sqrt[-(a^2*c*d)] + a*d*x))/((a^2*c - d)*
(Sqrt[-(a^2*c*d)] - a*d*x))] - PolyLog[2, ((a^2*c + d + (2*I)*Sqrt[-(a^2*c*
d)])*(Sqrt[-(a^2*c*d)] + a*d*x))/((a^2*c - d)*(Sqrt[-(a^2*c*d)] - a*d*x))])
)/Sqrt[-(a^2*c*d)] - (4*ArcCot[a*x]*Sin[2*ArcCot[a*x]])/(a^2*c + d + (-(a^2
*c) + d)*Cos[2*ArcCot[a*x]])))/(8*c)
```

Maple [B] time = 0.447, size = 2177, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c)^2,x)
```

```
[Out] 1/4*a^2*(d*c)^(1/2)/d/c*arctanh(1/4*(2*(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)-2*a^
2*c-2*d)/a/(d*c)^(1/2))/(a^2*c-d)+1/4*a*(a^2*c*d)^(1/2)/c/(a^2*c-d)/d*arcco
t(a*x)^2+1/8*a*(a^2*c*d)^(1/2)/c/(a^2*c-d)/d*polylog(2,(a^2*c-d)*(a*x+I)^2/
(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)+d))+1/4*(d*c)^(1/2)/c^2*arctanh(1/4*(2
*(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)-2*a^2*c-2*d)/a/(d*c)^(1/2))/(a^2*c-d)+1/4*
I/a*d^2*ln(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c*d)^(1/2)+d))*a
rccot(a*x)/(a^2*c-d)/c^2/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)-3/4*I*a*ln
(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c*d)^(1/2)+d))*arccot(a*x)
*d/c/(a^2*c-d)/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)-1/4*I*a^5*ln(1-(a^2*
c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c*d)^(1/2)+d))*arccot(a*x)/(a^2*c-
d)/d/(a^4*c^2-2*a^2*c*d+d^2)*(a^2*c*d)^(1/2)*c+3/4*a^3/(a^2*c-d)/(a^4*c^2-2
*a^2*c*d+d^2)*arccot(a*x)^2*(a^2*c*d)^(1/2)-a/(a^2*c-d)^2/c*d*ln((a*x+I)/(a
^2*x^2+1)^(1/2))+1/4*a/(a^2*c-d)^2/c*d*ln((a*x+I)^4/(a^2*x^2+1)^2*a^2*c-2*a
^2*c*(a*x+I)^2/(a^2*x^2+1)-(a*x+I)^4/(a^2*x^2+1)^2*d+a^2*c-2*(a*x+I)^2/(a^2
*x^2+1)*d-d)-1/4*a^4*(d*c)^(1/2)/d*arctanh(1/4*(2*(a^2*c-d)*(a*x+I)^2/(a^2*
x^2+1)-2*a^2*c-2*d)/a/(d*c)^(1/2))/(a^2*c-d)^2+3/8*a^3/(a^2*c-d)/(a^4*c^2-2
*a^2*c*d+d^2)*polylog(2,(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c*d)^
(1/2)+d))*(a^2*c*d)^(1/2)-1/2*I*a^3*arccot(a*x)/(a^2*c-d)/(a^2*d*x^2+a^2*c)
+1/4*(d*c)^(1/2)/c^2*d*arctanh(1/4*(2*(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)-2*a^2
*c-2*d)/a/(d*c)^(1/2))/(a^2*c-d)^2+1/2*a^4*arccot(a*x)/(a^2*c-d)/(a^2*d*x^2
+a^2*c)*x-1/4/a*(a^2*c*d)^(1/2)/(a^2*c-d)/c^2*arccot(a*x)^2-1/2*I*a^3*arcco
t(a*x)/(a^2*c-d)/c/(a^2*d*x^2+a^2*c)*x^2*d+1/4*I*a*(a^2*c*d)^(1/2)/c/(a^2*c
-d)/d*arccot(a*x)*ln(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(
1/2)+d))-1/8/a*(a^2*c*d)^(1/2)/(a^2*c-d)/c^2*polylog(2,(a^2*c-d)*(a*x+I)^2/
(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)+d))-1/4*a^3/(a^2*c-d)^2*ln((a*x+I)^4/(
a^2*x^2+1)^2*a^2*c-2*a^2*c*(a*x+I)^2/(a^2*x^2+1)-(a*x+I)^4/(a^2*x^2+1)^2*d+
a^2*c-2*(a*x+I)^2/(a^2*x^2+1)*d-d)+a^3/(a^2*c-d)^2*ln((a*x+I)/(a^2*x^2+1)^(
1/2))-3/8*a/(a^2*c-d)/c*d/(a^4*c^2-2*a^2*c*d+d^2)*polylog(2,(a^2*c-d)*(a*x+
I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c*d)^(1/2)+d))*(a^2*c*d)^(1/2)-1/8*a^5/(a^2*
c-d)/d/(a^4*c^2-2*a^2*c*d+d^2)*polylog(2,(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a
^2*c+2*(a^2*c*d)^(1/2)+d))*(a^2*c*d)^(1/2)*c-3/4*a/(a^2*c-d)/c*d/(a^4*c^2-2
*a^2*c*d+d^2)*arccot(a*x)^2*(a^2*c*d)^(1/2)-1/4*a^5/(a^2*c-d)/d/(a^4*c^2-2*
a^2*c*d+d^2)*arccot(a*x)^2*(a^2*c*d)^(1/2)*c+1/8/a/(a^2*c-d)/c^2*d^2/(a^4*c
^2-2*a^2*c*d+d^2)*polylog(2,(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c+2*(a^2*c
*d)^(1/2)+d))*(a^2*c*d)^(1/2)+3/4*I*a^3*ln(1-(a^2*c-d)*(a*x+I)^2/(a^2*x^2+1
)/(a^2*c+2*(a^2*c*d)^(1/2)+d))*arccot(a*x)/(a^2*c-d)/(a^4*c^2-2*a^2*c*d+d^2
)*(a^2*c*d)^(1/2)-1/4*I/a*(a^2*c*d)^(1/2)/(a^2*c-d)/c^2*arccot(a*x)*ln(1-(a
^2*c-d)*(a*x+I)^2/(a^2*x^2+1)/(a^2*c-2*(a^2*c*d)^(1/2)+d))-1/2*a^2*arccot(a
*x)/(a^2*c-d)/c/(a^2*d*x^2+a^2*c)*x*d+1/4/a/(a^2*c-d)/c^2*d^2/(a^4*c^2-2*a^
2*c*d+d^2)*arccot(a*x)^2*(a^2*c*d)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ax)}{d^2x^4 + 2\,cdx^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)/(d^2*x^4 + 2*c*d*x^2 + c^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)}{(dx^2 + c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^2,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)/(d*x^2 + c)^2, x)
```

3.59 $\int \sqrt{c+dx^2}\cot^{-1}(ax)\,dx$

Optimal. Leaf size=18

$$\text{Unintegrable}\left(\cot^{-1}(ax)\sqrt{c+dx^2},x\right)$$

```
[Out] Unintegrable[Sqrt[c + d*x^2]*ArcCot[a*x], x]
```

Rubi [A] time = 0.0186725, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \sqrt{c+dx^2}\cot^{-1}(ax)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + d*x^2]*ArcCot[a*x],x]
```

```
[Out] Defer[Int][Sqrt[c + d*x^2]*ArcCot[a*x], x]
```

Rubi steps

$$\int \sqrt{c+dx^2}\cot^{-1}(ax)\,dx=\int \sqrt{c+dx^2}\cot^{-1}(ax)\,dx$$

Mathematica [A] time = 5.40839, size = 0, normalized size = 0.

$$\int \sqrt{c+dx^2}\cot^{-1}(ax)\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + d*x^2]*ArcCot[a*x],x]
```

```
[Out] Integrate[Sqrt[c + d*x^2]*ArcCot[a*x], x]
```

Maple [A] time = 0.954, size = 0, normalized size = 0.

$$\int \sqrt{d x^2+c}\,\mathrm{arccot}\,(a x)\;d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x^2+c)^(1/2)*arccot(a*x),x)
```

```
[Out] int((d*x^2+c)^(1/2)*arccot(a*x),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^(1/2)*arccot(a*x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\sqrt{d x^2+c}\,\mathrm{arccot}\,(a x)\,,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^(1/2)*arccot(a*x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(d*x^2 + c)*arccot(a*x), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{c+d x^2}\,\mathrm{acot}\,(a x)\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x**2+c)**(1/2)*acot(a*x),x)
```

```
[Out] Integral(sqrt(c + d*x**2)*acot(a*x), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{dx^2 + c}\,\text{arccot}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^(1/2)*arccot(a*x),x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*x^2 + c)*arccot(a*x), x)
```

3.60 $\int \frac{\cot^{-1}(ax)}{\sqrt{c+dx^2}} \, dx$

Optimal. Leaf size=18

$$\text{Unintegrable}\left(\frac{\cot^{-1}(ax)}{\sqrt{c+dx^2}},x\right)$$

```
[Out] Unintegrable[ArcCot[a*x]/Sqrt[c + d*x^2], x]
```

Rubi [A] time = 0.0221814, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(ax)}{\sqrt{c+dx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[a*x]/Sqrt[c + d*x^2],x]
```

```
[Out] Defer[Int][ArcCot[a*x]/Sqrt[c + d*x^2], x]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)}{\sqrt{c+dx^2}} \, dx = \int \frac{\cot^{-1}(ax)}{\sqrt{c+dx^2}} \, dx$$

Mathematica [A] time = 3.74009, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(ax)}{\sqrt{c+dx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[a*x]/Sqrt[c + d*x^2],x]
```

```
[Out] Integrate[ArcCot[a*x]/Sqrt[c + d*x^2], x]
```

Maple [A] time = 0.858, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax) \frac{1}{\sqrt{dx^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c)^(1/2),x)
```

```
[Out] int(arccot(a*x)/(d*x^2+c)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\operatorname{arccot}(ax)}{\sqrt{dx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x)/sqrt(d*x^2 + c), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(ax)}{\sqrt{c+dx^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c)**(1/2),x)
```

```
[Out] Integral(acot(a*x)/sqrt(c + d*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ax)}{\sqrt{dx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x)/sqrt(d*x^2 + c), x)
```

3.61 $\int \frac{\cot^{-1}(ax)}{(c+dx^2)^{3/2}} \, dx$

Optimal. Leaf size=66

$$\frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}} - \frac{\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{c\sqrt{a^2c-d}}$$

```
[Out] (x*ArcCot[a*x])/(c*Sqrt[c + d*x^2]) - ArcTanh[(a*Sqrt[c + d*x^2])/Sqrt[a^2*
c - d]]/(c*Sqrt[a^2*c - d])
```

Rubi [A] time = 0.0940461, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {191, 4913, 12, 444, 63, 208}

$$\frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}} - \frac{\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{c\sqrt{a^2c-d}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/(c + d*x^2)^(3/2),x]
```

```
[Out] (x*ArcCot[a*x])/(c*Sqrt[c + d*x^2]) - ArcTanh[(a*Sqrt[c + d*x^2])/Sqrt[a^2*
c - d]]/(c*Sqrt[a^2*c - d])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{3/2}}\,dx &= \frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}}+a\int \frac{x}{c\left(1+a^2x^2\right)\sqrt{c+dx^2}}\,dx\\
&= \frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}}+\frac{a\int \frac{x}{\left(1+a^2x^2\right)\sqrt{c+dx^2}}\,dx}{c}\\
&= \frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}}+\frac{a\,\mathrm{Subst}\left(\int \frac{1}{\left(1+a^2x\right)\sqrt{c+dx}}\,dx,x,x^2\right)}{2c}\\
&= \frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}}+\frac{a\,\mathrm{Subst}\left(\int \frac{1}{1-\frac{a^2c}{d}+\frac{a^2x^2}{d}}\,dx,x,\sqrt{c+dx^2}\right)}{cd}\\
&= \frac{x\cot^{-1}(ax)}{c\sqrt{c+dx^2}}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{c\sqrt{a^2c-d}}
\end{aligned}$$

Mathematica [C] time = 0.227145, size = 169, normalized size = 2.56

$$\frac{\frac{2x\cot^{-1}(ax)}{\sqrt{c+dx^2}}+\frac{-\log\left(\frac{4ac\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac-idx\right)}{(ax+i)\sqrt{a^2c-d}}\right)-\log\left(\frac{4ac\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac+idx\right)}{(ax-i)\sqrt{a^2c-d}}\right)}{\sqrt{a^2c-d}}}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/(c + d*x^2)^(3/2),x]
```

```
[Out] ((2*x*ArcCot[a*x])/Sqrt[c + d*x^2] + (-Log[(4*a*c*(a*c - I*d*x + Sqrt[a^2*c
 - d]*Sqrt[c + d*x^2]))/(Sqrt[a^2*c - d]*(I + a*x))] - Log[(4*a*c*(a*c + I*
d*x + Sqrt[a^2*c - d]*Sqrt[c + d*x^2]))/(Sqrt[a^2*c - d]*(-I + a*x))])/Sqrt
[a^2*c - d])/(2*c)
```

Maple [F] time = 0.644, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax)\left(dx^2+c\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c)^(3/2),x)
```

```
[Out] int(arccot(a*x)/(d*x^2+c)^(3/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 2.32864, size = 729, normalized size = 11.05

$$\left[\frac{4\left(a^{2}c-d\right)\sqrt{dx^{2}+c}x\,\mathrm{arccot}\left(ax\right)+\sqrt{a^{2}c-d}\left(dx^{2}+c\right)\log\left(\frac{a^{4}d^{2}x^{4}+8\,a^{4}c^{2}-8\,a^{2}cd+2\left(4\,a^{4}cd-3\,a^{2}d^{2}\right)x^{2}-4\left(a^{3}dx^{2}+2\,a^{3}c-ad\right)\sqrt{a^{2}c-d}\sqrt{dx^{2}+c}}{a^{4}x^{4}+2\,a^{2}x^{2}+1}\right.}{4\left(a^{2}c^{3}-c^{2}d+\left(a^{2}c^{2}d-cd^{2}\right)x^{2}\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*(4*(a^2*c - d)*sqrt(d*x^2 + c)*x*arccot(a*x) + sqrt(a^2*c - d)*(d*x^2
+ c)*log((a^4*d^2*x^4 + 8*a^4*c^2 - 8*a^2*c*d + 2*(4*a^4*c*d - 3*a^2*d^2)*x
^2 - 4*(a^3*d*x^2 + 2*a^3*c - a*d)*sqrt(a^2*c - d)*sqrt(d*x^2 + c) + d^2)/(
a^4*x^4 + 2*a^2*x^2 + 1)))/(a^2*c^3 - c^2*d + (a^2*c^2*d - c*d^2)*x^2), 1/2
*(2*(a^2*c - d)*sqrt(d*x^2 + c)*x*arccot(a*x) - sqrt(-a^2*c + d)*(d*x^2 + c
)*arctan(-1/2*(a^2*d*x^2 + 2*a^2*c - d)*sqrt(-a^2*c + d)*sqrt(d*x^2 + c)/(a
^3*c^2 - a*c*d + (a^3*c*d - a*d^2)*x^2)))/(a^2*c^3 - c^2*d + (a^2*c^2*d - c
*d^2)*x^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{acot}\left(ax\right)}{\left(c+dx^{2}\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c)**(3/2),x)
```

```
[Out] Integral(acot(a*x)/(c + d*x**2)**(3/2), x)
```

Giac [A] time = 1.14364, size = 80, normalized size = 1.21

$$\frac{x\arctan\left(\frac{1}{ax}\right)}{\sqrt{dx^{2}+c}c}+\frac{\arctan\left(\frac{\sqrt{dx^{2}+c}a}{\sqrt{-a^{2}c+d}}\right)}{\sqrt{-a^{2}c+d}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] x*arctan(1/(a*x))/(sqrt(d*x^2 + c)*c) + arctan(sqrt(d*x^2 + c)*a/sqrt(-a^2*
c + d))/(sqrt(-a^2*c + d)*c)
```

3.62 $\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=134

$$-\frac{\left(3a^2c-2d\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{3c^2\left(a^2c-d\right)^{3/2}}+\frac{a}{3c\left(a^2c-d\right)\sqrt{c+dx^2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}$$

```
[Out] a/(3*c*(a^2*c - d)*Sqrt[c + d*x^2]) + (x*ArcCot[a*x])/(3*c*(c + d*x^2)^(3/2
)) + (2*x*ArcCot[a*x])/(3*c^2*Sqrt[c + d*x^2]) - ((3*a^2*c - 2*d)*ArcTanh[(
a*Sqrt[c + d*x^2])/Sqrt[a^2*c - d]])/(3*c^2*(a^2*c - d)^(3/2))
```

Rubi [A] time = 0.325742, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {192, 191, 4913, 6688, 12, 571, 78, 63, 208}

$$-\frac{\left(3a^2c-2d\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{3c^2\left(a^2c-d\right)^{3/2}}+\frac{a}{3c\left(a^2c-d\right)\sqrt{c+dx^2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/(c + d*x^2)^(5/2),x]
```

```
[Out] a/(3*c*(a^2*c - d)*Sqrt[c + d*x^2]) + (x*ArcCot[a*x])/(3*c*(c + d*x^2)^(3/2
)) + (2*x*ArcCot[a*x])/(3*c^2*Sqrt[c + d*x^2]) - ((3*a^2*c - 2*d)*ArcTanh[(
a*Sqrt[c + d*x^2])/Sqrt[a^2*c - d]])/(3*c^2*(a^2*c - d)^(3/2))
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 571

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{5/2}}\,dx = \frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+a\int \frac{\frac{x}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x}{3c^2\sqrt{c+dx^2}}}{1+a^2x^2}\,dx$$

$$= \frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+a\int \frac{x\left(3c+2dx^2\right)}{3c^2\left(1+a^2x^2\right)\left(c+dx^2\right)^{3/2}}\,dx$$

$$= \frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+\frac{a\int \frac{x\left(3c+2dx^2\right)}{\left(1+a^2x^2\right)\left(c+dx^2\right)^{3/2}}\,dx}{3c^2}$$

$$= \frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+\frac{a\,\mathrm{Subst}\left(\int \frac{3c+2dx}{\left(1+a^2x\right)(c+dx)^{3/2}}\,dx,x,x^2\right)}{6c^2}$$

$$= \frac{a}{3c\left(a^2c-d\right)\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+\frac{\left(a\left(3a^2c-2d\right)\right)\mathrm{Subst}\left(\int \frac{1}{\left(1+a^2x\right)\sqrt{c+dx}}\,dx,\right.}{6c^2\left(a^2c-d\right)}$$

$$= \frac{a}{3c\left(a^2c-d\right)\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}+\frac{\left(a\left(3a^2c-2d\right)\right)\mathrm{Subst}\left(\int \frac{1}{1-\frac{a^2c}{d}+\frac{a^2x^2}{d}}\,dx,x,\right.}{3c^2\left(a^2c-d\right)d}$$

$$= \frac{a}{3c\left(a^2c-d\right)\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{3c\left(c+dx^2\right)^{3/2}}+\frac{2x\cot^{-1}(ax)}{3c^2\sqrt{c+dx^2}}-\frac{\left(3a^2c-2d\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{3c^2\left(a^2c-d\right)^{3/2}}$$

Mathematica [C] time = 0.606831, size = 262, normalized size = 1.96

$$-\frac{\frac{\left(3a^2c-2d\right)\log\left(\frac{12ac^2\sqrt{a^2c-d}\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac-idx\right)}{(ax+i)\left(3a^2c-2d\right)}\right)}{\left(a^2c-d\right)^{3/2}}+\frac{\left(3a^2c-2d\right)\log\left(\frac{12ac^2\sqrt{a^2c-d}\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac+idx\right)}{(ax-i)\left(3a^2c-2d\right)}\right)}{\left(a^2c-d\right)^{3/2}}-\frac{2ac}{\left(a^2c-d\right)\sqrt{c+dx^2}}-\frac{2x\cot^{-1}(ax)\left(3c+2dx^2\right)}{\left(c+dx^2\right)^{3/2}}}{6c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/(c + d*x^2)^(5/2),x]
```

```
[Out] -((-2*a*c)/((a^2*c - d)*Sqrt[c + d*x^2]) - (2*x*(3*c + 2*d*x^2)*ArcCot[a*x]
)/(c + d*x^2)^(3/2) + ((3*a^2*c - 2*d)*Log[(12*a*c^2*Sqrt[a^2*c - d]*(a*c -
 I*d*x + Sqrt[a^2*c - d]*Sqrt[c + d*x^2]))/((3*a^2*c - 2*d)*(I + a*x))])/(a
^2*c - d)^(3/2) + ((3*a^2*c - 2*d)*Log[(12*a*c^2*Sqrt[a^2*c - d]*(a*c + I*d
*x + Sqrt[a^2*c - d]*Sqrt[c + d*x^2]))/((3*a^2*c - 2*d)*(-I + a*x))])/(a^2*
c - d)^(3/2))/(6*c^2)
```

Maple [F] time = 0.665, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax)\left(dx^2+c\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c)^(5/2),x)
```

```
[Out] int(arccot(a*x)/(d*x^2+c)^(5/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 2.81989, size = 1450, normalized size = 10.82

$$\Bigg[\frac{\left(3\,a^2c^3+\left(3\,a^2cd^2-2\,d^3\right)x^4-2\,c^2d+2\left(3\,a^2c^2d-2\,cd^2\right)x^2\right)\sqrt{a^2c-d}\,\log\Bigg(\frac{a^4d^2x^4+8\,a^4c^2-8\,a^2cd+2\left(4\,a^4cd-3\,a^2d^2\right)x^2-4\,(a^3dx^2+2\,a^3}{a^4x^4+2\,a^2x^2+1}}{12\,(a^4c^6-2\,a^2c^5d+c^4d^2+(a^4c^4d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/12*((3*a^2*c^3 + (3*a^2*c*d^2 - 2*d^3)*x^4 - 2*c^2*d + 2*(3*a^2*c^2*d -
2*c*d^2)*x^2)*sqrt(a^2*c - d)*log((a^4*d^2*x^4 + 8*a^4*c^2 - 8*a^2*c*d + 2*
(4*a^4*c*d - 3*a^2*d^2)*x^2 - 4*(a^3*d*x^2 + 2*a^3*c - a*d)*sqrt(a^2*c - d)
*sqrt(d*x^2 + c) + d^2)/(a^4*x^4 + 2*a^2*x^2 + 1)) + 4*(a^3*c^3 - a*c^2*d +
 (a^3*c^2*d - a*c*d^2)*x^2 + (2*(a^4*c^2*d - 2*a^2*c*d^2 + d^3)*x^3 + 3*(a^
4*c^3 - 2*a^2*c^2*d + c*d^2)*x)*arccot(a*x))*sqrt(d*x^2 + c))/(a^4*c^6 - 2*
a^2*c^5*d + c^4*d^2 + (a^4*c^4*d^2 - 2*a^2*c^3*d^3 + c^2*d^4)*x^4 + 2*(a^4*
c^5*d - 2*a^2*c^4*d^2 + c^3*d^3)*x^2), -1/6*((3*a^2*c^3 + (3*a^2*c*d^2 - 2*
d^3)*x^4 - 2*c^2*d + 2*(3*a^2*c^2*d - 2*c*d^2)*x^2)*sqrt(-a^2*c + d)*arctan
(-1/2*(a^2*d*x^2 + 2*a^2*c - d)*sqrt(-a^2*c + d)*sqrt(d*x^2 + c)/(a^3*c^2 -
 a*c*d + (a^3*c*d - a*d^2)*x^2)) - 2*(a^3*c^3 - a*c^2*d + (a^3*c^2*d - a*c*
d^2)*x^2 + (2*(a^4*c^2*d - 2*a^2*c*d^2 + d^3)*x^3 + 3*(a^4*c^3 - 2*a^2*c^2*
d + c*d^2)*x)*arccot(a*x))*sqrt(d*x^2 + c))/(a^4*c^6 - 2*a^2*c^5*d + c^4*d^
2 + (a^4*c^4*d^2 - 2*a^2*c^3*d^3 + c^2*d^4)*x^4 + 2*(a^4*c^5*d - 2*a^2*c^4*
d^2 + c^3*d^3)*x^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(ax)}{\left(c+dx^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c)**(5/2),x)
```

```
[Out] Integral(acot(a*x)/(c + d*x**2)**(5/2), x)
```

Giac [A] time = 1.17533, size = 170, normalized size = 1.27

$$\frac{1}{3}\,a\left(\frac{\left(3\,a^2c-2\,d\right)\arctan\left(\frac{\sqrt{dx^2+c}a}{\sqrt{-a^2c+d}}\right)}{\left(a^2c^3-c^2d\right)\sqrt{-a^2c+d}a}+\frac{1}{\left(a^2c^2-cd\right)\sqrt{dx^2+c}}\right)+\frac{x\left(\frac{2\,dx^2}{c^2}+\frac{3}{c}\right)\arctan\left(\frac{1}{ax}\right)}{3\left(dx^2+c\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] 1/3*a*((3*a^2*c - 2*d)*arctan(sqrt(d*x^2 + c)*a/sqrt(-a^2*c + d))/((a^2*c^3
 - c^2*d)*sqrt(-a^2*c + d)*a) + 1/((a^2*c^2 - c*d)*sqrt(d*x^2 + c))) + 1/3*
x*(2*d*x^2/c^2 + 3/c)*arctan(1/(a*x))/(d*x^2 + c)^(3/2)
```

3.63 $\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{7/2}}\,dx$

Optimal. Leaf size=208

$$-\frac{\left(15a^4c^2-20a^2cd+8d^2\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{15c^3\left(a^2c-d\right)^{5/2}}+\frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}}+\frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+\cdots$$

```
[Out] a/(15*c*(a^2*c - d)*(c + d*x^2)^(3/2)) + (a*(7*a^2*c - 4*d))/(15*c^2*(a^2*c
 - d)^2*Sqrt[c + d*x^2]) + (x*ArcCot[a*x])/(5*c*(c + d*x^2)^(5/2)) + (4*x*A
rcCot[a*x])/(15*c^2*(c + d*x^2)^(3/2)) + (8*x*ArcCot[a*x])/(15*c^3*Sqrt[c +
 d*x^2]) - ((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*ArcTanh[(a*Sqrt[c + d*x^2])/S
qrt[a^2*c - d]])/(15*c^3*(a^2*c - d)^(5/2))
```

Rubi [A] time = 0.934717, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {192, 191, 4913, 6688, 12, 6715, 897, 1261, 208}

$$-\frac{\left(15a^4c^2-20a^2cd+8d^2\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{15c^3\left(a^2c-d\right)^{5/2}}+\frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}}+\frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/(c + d*x^2)^(7/2),x]
```


```
[Out] a/(15*c*(a^2*c - d)*(c + d*x^2)^(3/2)) + (a*(7*a^2*c - 4*d))/(15*c^2*(a^2*c
 - d)^2*Sqrt[c + d*x^2]) + (x*ArcCot[a*x])/(5*c*(c + d*x^2)^(5/2)) + (4*x*A
rcCot[a*x])/(15*c^2*(c + d*x^2)^(3/2)) + (8*x*ArcCot[a*x])/(15*c^3*Sqrt[c +
 d*x^2]) - ((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*ArcTanh[(a*Sqrt[c + d*x^2])/S
qrt[a^2*c - d]])/(15*c^3*(a^2*c - d)^(5/2))
```


Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{7/2}}\,dx = \frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+a\int \frac{\frac{x}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x}{15c^3\sqrt{c+dx^2}}}{1+a^2x^2}\,dx$$

$$= \frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+a\int \frac{x\left(15c^2+20cdx^2+8d^2x^4\right)}{15c^3\left(1+a^2x^2\right)\left(c+dx^2\right)^{5/2}}\,dx$$

$$= \frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+\frac{a\int \frac{x\left(15c^2+20cdx^2+8d^2x^4\right)}{\left(1+a^2x^2\right)\left(c+dx^2\right)^{5/2}}\,dx}{15c^3}$$

$$= \frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+\frac{a\,\mathrm{Subst}\left(\int \frac{15c^2+20cdx+8d^2x^2}{(1+a^2x)(c+dx)^{5/2}}\,dx,x,x^2\right)}{30c^3}$$

$$= \frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+\frac{a\,\mathrm{Subst}\left(\int \frac{3c^2+4cx^2+8x^4}{x^4\left(\frac{-a^2c+d}{d}+\frac{a^2x^2}{d}\right)}\,dx,x,\sqrt{c+dx^2}\right)}{15c^3d}$$

$$= \frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\cot^{-1}(ax)}{15c^3\sqrt{c+dx^2}}+\frac{a\,\mathrm{Subst}\left(\int\left(\frac{3c^2d}{\left(-a^2c+d\right)x^4}-\frac{c\left(7a^2c-4d\right)d}{\left(-a^2c+d\right)^2x^2}+\frac{d\left(15a^4c\right.}{\left(-a^2c+d\right)}\right.\right.}{15c^3d}$$

$$= \frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}}+\frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\,\mathrm{co}}{15c^3\sqrt{}}$$

$$= \frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}}+\frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}}+\frac{x\cot^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}}+\frac{4x\cot^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}+\frac{8x\,\mathrm{co}}{15c^3\sqrt{}}$$

Mathematica [C] time = 0.938296, size = 345, normalized size = 1.66

$$-\frac{\frac{\left(15a^4c^2-20a^2cd+8d^2\right)\log\left(\frac{60ac^3\left(a^2c-d\right)^{3/2}\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac-idx\right)}{(ax+i)\left(15a^4c^2-20a^2cd+8d^2\right)}\right)}{\left(a^2c-d\right)^{5/2}}+\frac{\left(15a^4c^2-20a^2cd+8d^2\right)\log\left(\frac{60ac^3\left(a^2c-d\right)^{3/2}\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac+idx\right)}{(ax-i)\left(15a^4c^2-20a^2cd+8d^2\right)}\right)}{\left(a^2c-d\right)^{5/2}}-\frac{2ac\left(a^2c\left(8c+7dx^2\right)\right.}{\left(d-a^2c\right)^2\left(c+\right.}}{30c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/(c + d*x^2)^(7/2),x]
```

```
[Out] -((-2*a*c*(-(d*(5*c + 4*d*x^2)) + a^2*c*(8*c + 7*d*x^2)))/((-(a^2*c) + d)^2
*(c + d*x^2)^(3/2)) - (2*x*(15*c^2 + 20*c*d*x^2 + 8*d^2*x^4)*ArcCot[a*x])/(
c + d*x^2)^(5/2) + ((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*Log[(60*a*c^3*(a^2*c
- d)^(3/2)*(a*c - I*d*x + Sqrt[a^2*c - d]*Sqrt[c + d*x^2]))/((15*a^4*c^2 -
20*a^2*c*d + 8*d^2)*(I + a*x))])/(a^2*c - d)^(5/2) + ((15*a^4*c^2 - 20*a^2*
c*d + 8*d^2)*Log[(60*a*c^3*(a^2*c - d)^(3/2)*(a*c + I*d*x + Sqrt[a^2*c - d]
*Sqrt[c + d*x^2]))/((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*(-I + a*x))])/(a^2*c
- d)^(5/2))/(30*c^3)
```

Maple [F] time = 0.891, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax)\left(dx^2+c\right)^{-\frac{7}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c)^(7/2),x)
```

```
[Out] int(arccot(a*x)/(d*x^2+c)^(7/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 3.58127, size = 2569, normalized size = 12.35

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] [1/60*((15*a^4*c^5 - 20*a^2*c^4*d + (15*a^4*c^2*d^3 - 20*a^2*c*d^4 + 8*d^5)
*x^6 + 8*c^3*d^2 + 3*(15*a^4*c^3*d^2 - 20*a^2*c^2*d^3 + 8*c*d^4)*x^4 + 3*(1
5*a^4*c^4*d - 20*a^2*c^3*d^2 + 8*c^2*d^3)*x^2)*sqrt(a^2*c - d)*log((a^4*d^2
*x^4 + 8*a^4*c^2 - 8*a^2*c*d + 2*(4*a^4*c*d - 3*a^2*d^2)*x^2 - 4*(a^3*d*x^2
 + 2*a^3*c - a*d)*sqrt(a^2*c - d)*sqrt(d*x^2 + c) + d^2)/(a^4*x^4 + 2*a^2*x
^2 + 1)) + 4*(8*a^5*c^5 - 13*a^3*c^4*d + 5*a*c^3*d^2 + (7*a^5*c^3*d^2 - 11*
a^3*c^2*d^3 + 4*a*c*d^4)*x^4 + 3*(5*a^5*c^4*d - 8*a^3*c^3*d^2 + 3*a*c^2*d^3
)*x^2 + (8*(a^6*c^3*d^2 - 3*a^4*c^2*d^3 + 3*a^2*c*d^4 - d^5)*x^5 + 20*(a^6*
c^4*d - 3*a^4*c^3*d^2 + 3*a^2*c^2*d^3 - c*d^4)*x^3 + 15*(a^6*c^5 - 3*a^4*c^
4*d + 3*a^2*c^3*d^2 - c^2*d^3)*x)*arccot(a*x))*sqrt(d*x^2 + c))/(a^6*c^9 -
3*a^4*c^8*d + 3*a^2*c^7*d^2 - c^6*d^3 + (a^6*c^6*d^3 - 3*a^4*c^5*d^4 + 3*a^
2*c^4*d^5 - c^3*d^6)*x^6 + 3*(a^6*c^7*d^2 - 3*a^4*c^6*d^3 + 3*a^2*c^5*d^4 -
 c^4*d^5)*x^4 + 3*(a^6*c^8*d - 3*a^4*c^7*d^2 + 3*a^2*c^6*d^3 - c^5*d^4)*x^2
), -1/30*((15*a^4*c^5 - 20*a^2*c^4*d + (15*a^4*c^2*d^3 - 20*a^2*c*d^4 + 8*d
^5)*x^6 + 8*c^3*d^2 + 3*(15*a^4*c^3*d^2 - 20*a^2*c^2*d^3 + 8*c*d^4)*x^4 + 3
*(15*a^4*c^4*d - 20*a^2*c^3*d^2 + 8*c^2*d^3)*x^2)*sqrt(-a^2*c + d)*arctan(-
1/2*(a^2*d*x^2 + 2*a^2*c - d)*sqrt(-a^2*c + d)*sqrt(d*x^2 + c)/(a^3*c^2 - a
*c*d + (a^3*c*d - a*d^2)*x^2)) - 2*(8*a^5*c^5 - 13*a^3*c^4*d + 5*a*c^3*d^2
+ (7*a^5*c^3*d^2 - 11*a^3*c^2*d^3 + 4*a*c*d^4)*x^4 + 3*(5*a^5*c^4*d - 8*a^3
*c^3*d^2 + 3*a*c^2*d^3)*x^2 + (8*(a^6*c^3*d^2 - 3*a^4*c^2*d^3 + 3*a^2*c*d^4
 - d^5)*x^5 + 20*(a^6*c^4*d - 3*a^4*c^3*d^2 + 3*a^2*c^2*d^3 - c*d^4)*x^3 +
15*(a^6*c^5 - 3*a^4*c^4*d + 3*a^2*c^3*d^2 - c^2*d^3)*x)*arccot(a*x))*sqrt(d
*x^2 + c))/(a^6*c^9 - 3*a^4*c^8*d + 3*a^2*c^7*d^2 - c^6*d^3 + (a^6*c^6*d^3
- 3*a^4*c^5*d^4 + 3*a^2*c^4*d^5 - c^3*d^6)*x^6 + 3*(a^6*c^7*d^2 - 3*a^4*c^6
*d^3 + 3*a^2*c^5*d^4 - c^4*d^5)*x^4 + 3*(a^6*c^8*d - 3*a^4*c^7*d^2 + 3*a^2*
c^6*d^3 - c^5*d^4)*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c)**(7/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.21745, size = 281, normalized size = 1.35

$$\frac{1}{15}a\left(\frac{\left(15\,a^4c^2-20\,a^2cd+8\,d^2\right)\arctan\left(\frac{\sqrt{dx^2+c}a}{\sqrt{-a^2c+d}}\right)}{\left(a^4c^5-2\,a^2c^4d+c^3d^2\right)\sqrt{-a^2c+d}a}+\frac{7\left(dx^2+c\right)a^2c+a^2c^2-4\left(dx^2+c\right)d-cd}{\left(a^4c^4-2\,a^2c^3d+c^2d^2\right)\left(dx^2+c\right)^{\frac{3}{2}}}\right)+\frac{\left(4\,x^2\left(\frac{2\,d^2x^2}{c^3}+\frac{5\,d}{c^2}\right)+1\right.}{15\left(dx^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] 1/15*a*((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*arctan(sqrt(d*x^2 + c)*a/sqrt(-a^
2*c + d))/((a^4*c^5 - 2*a^2*c^4*d + c^3*d^2)*sqrt(-a^2*c + d)*a) + (7*(d*x^
2 + c)*a^2*c + a^2*c^2 - 4*(d*x^2 + c)*d - c*d)/((a^4*c^4 - 2*a^2*c^3*d + c
^2*d^2)*(d*x^2 + c)^(3/2))) + 1/15*(4*x^2*(2*d^2*x^2/c^3 + 5*d/c^2) + 15/c)
*x*arctan(1/(a*x))/(d*x^2 + c)^(5/2)
```

3.64 $\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{9/2}}\,dx$

Optimal. Leaf size=293

$$\frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}-\frac{\left(-70a^4c^2d+35a^6c^3+56a^2cd^2-16d^3\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{35c^4\left(a^2c-d\right)^{7/2}}+\frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}}+$$

```
[Out] a/(35*c*(a^2*c - d)*(c + d*x^2)^(5/2)) + (a*(11*a^2*c - 6*d))/(105*c^2*(a^2
*c - d)^2*(c + d*x^2)^(3/2)) + (a*(19*a^4*c^2 - 22*a^2*c*d + 8*d^2))/(35*c^
3*(a^2*c - d)^3*Sqrt[c + d*x^2]) + (x*ArcCot[a*x])/(7*c*(c + d*x^2)^(7/2))
+ (6*x*ArcCot[a*x])/(35*c^2*(c + d*x^2)^(5/2)) + (8*x*ArcCot[a*x])/(35*c^3*
(c + d*x^2)^(3/2)) + (16*x*ArcCot[a*x])/(35*c^4*Sqrt[c + d*x^2]) - ((35*a^6
*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*ArcTanh[(a*Sqrt[c + d*x^2])/Sq
rt[a^2*c - d]])/(35*c^4*(a^2*c - d)^(7/2))
```

Rubi [A] time = 1.1551, antiderivative size = 293, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {192, 191, 4913, 6688, 12, 6715, 1619, 63, 208}

$$\frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}-\frac{\left(-70a^4c^2d+35a^6c^3+56a^2cd^2-16d^3\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{35c^4\left(a^2c-d\right)^{7/2}}+\frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x]/(c + d*x^2)^(9/2),x]
```

```
[Out] a/(35*c*(a^2*c - d)*(c + d*x^2)^(5/2)) + (a*(11*a^2*c - 6*d))/(105*c^2*(a^2
*c - d)^2*(c + d*x^2)^(3/2)) + (a*(19*a^4*c^2 - 22*a^2*c*d + 8*d^2))/(35*c^
3*(a^2*c - d)^3*Sqrt[c + d*x^2]) + (x*ArcCot[a*x])/(7*c*(c + d*x^2)^(7/2))
+ (6*x*ArcCot[a*x])/(35*c^2*(c + d*x^2)^(5/2)) + (8*x*ArcCot[a*x])/(35*c^3*
(c + d*x^2)^(3/2)) + (16*x*ArcCot[a*x])/(35*c^4*Sqrt[c + d*x^2]) - ((35*a^6
*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*ArcTanh[(a*Sqrt[c + d*x^2])/Sq
rt[a^2*c - d]])/(35*c^4*(a^2*c - d)^(7/2))
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
```

```
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4913

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcCot[c*x], u, x]
+ Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rule 1619

```
Int[((Px_)*((c_.) + (d_.)*(x_))^(n_.))/((a_.) + (b_.)*(x_)), x_Symbol] :> I
nt[ExpandIntegrand[1/Sqrt[c + d*x], (Px*(c + d*x)^(n + 1/2))/(a + b*x), x],
 x] /; FreeQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[n + 1/2, 0] && GtQ
[Expon[Px, x], 2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax)}{\left(c+dx^2\right)^{9/2}}\,dx = \frac{x\cot^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\cot^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\cot^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\cot^{-1}(ax)}{35c^4\sqrt{c+dx^2}} + a\int \frac{\frac{x}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x}{35c^2\left(c+d\right.}}{}$$

$$= \frac{x\cot^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\cot^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\cot^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\cot^{-1}(ax)}{35c^4\sqrt{c+dx^2}} + a\int \frac{x\left(35c^3+70c^2dx^2+\right.}{35c^4\left(1+a^2x^2\right.}$$

$$= \frac{x\cot^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\cot^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\cot^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\cot^{-1}(ax)}{35c^4\sqrt{c+dx^2}} + \frac{a\int \frac{x\left(35c^3+70c^2dx^2+56cd^2x^4+\right.}{\left(1+a^2x^2\right)\left(c+dx^2\right)^{7/2}}}{35c^4}$$

$$= \frac{x\cot^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\cot^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\cot^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\cot^{-1}(ax)}{35c^4\sqrt{c+dx^2}} + \frac{a\,\mathrm{Subst}\left(\int \frac{35c^3+70c^2dx+56}{\left(1+a^2x\right)(c}\right.}{70c^4}$$

$$= \frac{x\cot^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\cot^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\cot^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\cot^{-1}(ax)}{35c^4\sqrt{c+dx^2}} + \frac{a\,\mathrm{Subst}\left(\int\left(-\frac{5c^3d}{\left(a^2c-d\right)(c+dx}\right.\right.}{}$$

$$= \frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}} + \frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}} + \frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}} + \frac{x\cot^{-1}(}{7c\left(c+dx\right.}$$

$$= \frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}} + \frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}} + \frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}} + \frac{x\cot^{-1}(}{7c\left(c+dx\right.}$$

$$= \frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}} + \frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}} + \frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}} + \frac{x\cot^{-1}(}{7c\left(c+dx\right.}$$

Mathematica [C] time = 1.39481, size = 450, normalized size = 1.54

$$\frac{\frac{2ac\left(3\left(19a^4c^2-22a^2cd+8d^2\right)\left(c+dx^2\right)^2+3c^2\left(d-a^2c\right)^2+c\left(11a^2c-6d\right)\left(a^2c-d\right)\left(c+dx^2\right)\right)}{\left(a^2c-d\right)^3\left(c+dx^2\right)^{5/2}}-\frac{3\left(-70a^4c^2d+35a^6c^3+56a^2cd^2-16d^3\right)\log\left(\frac{140ac^4\left(a^2c-d\right)^{5/2}\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+\cdots\right.}{(ax+i)\left(-70a^4c^2d+35a^6c^3+56a^2cd^2\cdots\right.}\right.}{\left(a^2c-d\right)^{7/2}}}{210c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x]/(c + d*x^2)^(9/2),x]
```

```
[Out] ((2*a*c*(3*c^2*(-(a^2*c) + d)^2 + c*(11*a^2*c - 6*d)*(a^2*c - d)*(c + d*x^2
) + 3*(19*a^4*c^2 - 22*a^2*c*d + 8*d^2)*(c + d*x^2)^2))/((a^2*c - d)^3*(c +
 d*x^2)^(5/2)) + (6*x*(35*c^3 + 70*c^2*d*x^2 + 56*c*d^2*x^4 + 16*d^3*x^6)*A
rcCot[a*x])/(c + d*x^2)^(7/2) - (3*(35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^
2 - 16*d^3)*Log[(140*a*c^4*(a^2*c - d)^(5/2)*(a*c - I*d*x + Sqrt[a^2*c - d]
*Sqrt[c + d*x^2]))/((35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*(I
+ a*x))])/(a^2*c - d)^(7/2) - (3*(35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2
- 16*d^3)*Log[(140*a*c^4*(a^2*c - d)^(5/2)*(a*c + I*d*x + Sqrt[a^2*c - d]*S
qrt[c + d*x^2]))/((35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*(-I +
 a*x))])/(a^2*c - d)^(7/2))/(210*c^4)
```

Maple [F] time = 0.725, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(ax)\left(dx^2+c\right)^{-\frac{9}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x)/(d*x^2+c)^(9/2),x)
```

```
[Out] int(arccot(a*x)/(d*x^2+c)^(9/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(9/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 7.70193, size = 4097, normalized size = 13.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(9/2),x, algorithm="fricas")
```

```
[Out] [1/420*(3*(35*a^6*c^7 - 70*a^4*c^6*d + 56*a^2*c^5*d^2 + (35*a^6*c^3*d^4 - 7
0*a^4*c^2*d^5 + 56*a^2*c*d^6 - 16*d^7)*x^8 - 16*c^4*d^3 + 4*(35*a^6*c^4*d^3
 - 70*a^4*c^3*d^4 + 56*a^2*c^2*d^5 - 16*c*d^6)*x^6 + 6*(35*a^6*c^5*d^2 - 70
*a^4*c^4*d^3 + 56*a^2*c^3*d^4 - 16*c^2*d^5)*x^4 + 4*(35*a^6*c^6*d - 70*a^4*
c^5*d^2 + 56*a^2*c^4*d^3 - 16*c^3*d^4)*x^2)*sqrt(a^2*c - d)*log((a^4*d^2*x^
4 + 8*a^4*c^2 - 8*a^2*c*d + 2*(4*a^4*c*d - 3*a^2*d^2)*x^2 - 4*(a^3*d*x^2 +
2*a^3*c - a*d)*sqrt(a^2*c - d)*sqrt(d*x^2 + c) + d^2)/(a^4*x^4 + 2*a^2*x^2
+ 1)) + 4*(71*a^7*c^7 - 160*a^5*c^6*d + 122*a^3*c^5*d^2 - 33*a*c^4*d^3 + 3*
(19*a^7*c^4*d^3 - 41*a^5*c^3*d^4 + 30*a^3*c^2*d^5 - 8*a*c*d^6)*x^6 + (182*a
^7*c^5*d^2 - 397*a^5*c^4*d^3 + 293*a^3*c^3*d^4 - 78*a*c^2*d^5)*x^4 + (196*a
^7*c^6*d - 434*a^5*c^5*d^2 + 325*a^3*c^4*d^3 - 87*a*c^3*d^4)*x^2 + 3*(16*(a
^8*c^4*d^3 - 4*a^6*c^3*d^4 + 6*a^4*c^2*d^5 - 4*a^2*c*d^6 + d^7)*x^7 + 56*(a
^8*c^5*d^2 - 4*a^6*c^4*d^3 + 6*a^4*c^3*d^4 - 4*a^2*c^2*d^5 + c*d^6)*x^5 + 7
0*(a^8*c^6*d - 4*a^6*c^5*d^2 + 6*a^4*c^4*d^3 - 4*a^2*c^3*d^4 + c^2*d^5)*x^3
 + 35*(a^8*c^7 - 4*a^6*c^6*d + 6*a^4*c^5*d^2 - 4*a^2*c^4*d^3 + c^3*d^4)*x)*
arccot(a*x))*sqrt(d*x^2 + c))/(a^8*c^12 - 4*a^6*c^11*d + 6*a^4*c^10*d^2 - 4
*a^2*c^9*d^3 + c^8*d^4 + (a^8*c^8*d^4 - 4*a^6*c^7*d^5 + 6*a^4*c^6*d^6 - 4*a
^2*c^5*d^7 + c^4*d^8)*x^8 + 4*(a^8*c^9*d^3 - 4*a^6*c^8*d^4 + 6*a^4*c^7*d^5
- 4*a^2*c^6*d^6 + c^5*d^7)*x^6 + 6*(a^8*c^10*d^2 - 4*a^6*c^9*d^3 + 6*a^4*c^
8*d^4 - 4*a^2*c^7*d^5 + c^6*d^6)*x^4 + 4*(a^8*c^11*d - 4*a^6*c^10*d^2 + 6*a
^4*c^9*d^3 - 4*a^2*c^8*d^4 + c^7*d^5)*x^2), -1/210*(3*(35*a^6*c^7 - 70*a^4*
c^6*d + 56*a^2*c^5*d^2 + (35*a^6*c^3*d^4 - 70*a^4*c^2*d^5 + 56*a^2*c*d^6 -
16*d^7)*x^8 - 16*c^4*d^3 + 4*(35*a^6*c^4*d^3 - 70*a^4*c^3*d^4 + 56*a^2*c^2*
d^5 - 16*c*d^6)*x^6 + 6*(35*a^6*c^5*d^2 - 70*a^4*c^4*d^3 + 56*a^2*c^3*d^4 -
 16*c^2*d^5)*x^4 + 4*(35*a^6*c^6*d - 70*a^4*c^5*d^2 + 56*a^2*c^4*d^3 - 16*c
^3*d^4)*x^2)*sqrt(-a^2*c + d)*arctan(-1/2*(a^2*d*x^2 + 2*a^2*c - d)*sqrt(-a
^2*c + d)*sqrt(d*x^2 + c)/(a^3*c^2 - a*c*d + (a^3*c*d - a*d^2)*x^2)) - 2*(7
1*a^7*c^7 - 160*a^5*c^6*d + 122*a^3*c^5*d^2 - 33*a*c^4*d^3 + 3*(19*a^7*c^4*
d^3 - 41*a^5*c^3*d^4 + 30*a^3*c^2*d^5 - 8*a*c*d^6)*x^6 + (182*a^7*c^5*d^2 -
 397*a^5*c^4*d^3 + 293*a^3*c^3*d^4 - 78*a*c^2*d^5)*x^4 + (196*a^7*c^6*d - 4
```

```
34*a^5*c^5*d^2 + 325*a^3*c^4*d^3 - 87*a*c^3*d^4)*x^2 + 3*(16*(a^8*c^4*d^3 -
 4*a^6*c^3*d^4 + 6*a^4*c^2*d^5 - 4*a^2*c*d^6 + d^7)*x^7 + 56*(a^8*c^5*d^2 -
 4*a^6*c^4*d^3 + 6*a^4*c^3*d^4 - 4*a^2*c^2*d^5 + c*d^6)*x^5 + 70*(a^8*c^6*d
 - 4*a^6*c^5*d^2 + 6*a^4*c^4*d^3 - 4*a^2*c^3*d^4 + c^2*d^5)*x^3 + 35*(a^8*c
^7 - 4*a^6*c^6*d + 6*a^4*c^5*d^2 - 4*a^2*c^4*d^3 + c^3*d^4)*x)*arccot(a*x))
*sqrt(d*x^2 + c))/(a^8*c^12 - 4*a^6*c^11*d + 6*a^4*c^10*d^2 - 4*a^2*c^9*d^3
 + c^8*d^4 + (a^8*c^8*d^4 - 4*a^6*c^7*d^5 + 6*a^4*c^6*d^6 - 4*a^2*c^5*d^7 +
 c^4*d^8)*x^8 + 4*(a^8*c^9*d^3 - 4*a^6*c^8*d^4 + 6*a^4*c^7*d^5 - 4*a^2*c^6*
d^6 + c^5*d^7)*x^6 + 6*(a^8*c^10*d^2 - 4*a^6*c^9*d^3 + 6*a^4*c^8*d^4 - 4*a^
2*c^7*d^5 + c^6*d^6)*x^4 + 4*(a^8*c^11*d - 4*a^6*c^10*d^2 + 6*a^4*c^9*d^3 -
 4*a^2*c^8*d^4 + c^7*d^5)*x^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x)/(d*x**2+c)**(9/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.23049, size = 459, normalized size = 1.57

$$\frac{1}{105}a\left(\frac{3\left(35\,a^6c^3-70\,a^4c^2d+56\,a^2cd^2-16\,d^3\right)\arctan\left(\frac{\sqrt{dx^2+c}a}{\sqrt{-a^2c+d}}\right)}{\left(a^6c^7-3\,a^4c^6d+3\,a^2c^5d^2-c^4d^3\right)\sqrt{-a^2c+d}a}+\frac{57\left(dx^2+c\right)^2a^4c^2+11\left(dx^2+c\right)a^4c^3+3\,a^4c^4-66\cdots}{\left(a^6\cdots\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x)/(d*x^2+c)^(9/2),x, algorithm="giac")
```

```
[Out] 1/105*a*(3*(35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*arctan(sqrt(
d*x^2 + c)*a/sqrt(-a^2*c + d))/((a^6*c^7 - 3*a^4*c^6*d + 3*a^2*c^5*d^2 - c^
4*d^3)*sqrt(-a^2*c + d)*a) + (57*(d*x^2 + c)^2*a^4*c^2 + 11*(d*x^2 + c)*a^4
*c^3 + 3*a^4*c^4 - 66*(d*x^2 + c)^2*a^2*c*d - 17*(d*x^2 + c)*a^2*c^2*d - 6*
a^2*c^3*d + 24*(d*x^2 + c)^2*d^2 + 6*(d*x^2 + c)*c*d^2 + 3*c^2*d^2)/((a^6*c
^6 - 3*a^4*c^5*d + 3*a^2*c^4*d^2 - c^3*d^3)*(d*x^2 + c)^(5/2))) + 1/35*(2*(
```

```
4*x^2*(2*d^3*x^2/c^4 + 7*d^2/c^3) + 35*d/c^2)*x^2 + 35/c)*x*arctan(1/(a*x))
/(d*x^2 + c)^(7/2)
```

3.65 $\int \sqrt{a+ax^2}\cot^{-1}(x)\,dx$

Optimal. Leaf size=195

$$-\frac{ia\sqrt{x^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{2\sqrt{ax^2+a}}+\frac{ia\sqrt{x^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{2\sqrt{ax^2+a}}+\frac{1}{2}\sqrt{ax^2+a}+\frac{1}{2}x\sqrt{ax^2+a}\cot^{-1}(x)-\frac{ia\sqrt{x^2+1}\,\text{t}}{}$$

```
[Out] Sqrt[a + a*x^2]/2 + (x*Sqrt[a + a*x^2]*ArcCot[x])/2 - (I*a*Sqrt[1 + x^2]*Ar
cCot[x]*ArcTan[Sqrt[1 + I*x]/Sqrt[1 - I*x]])/Sqrt[a + a*x^2] - ((I/2)*a*Sqr
t[1 + x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*x])/Sqrt[1 - I*x]])/Sqrt[a + a*x^2]
+ ((I/2)*a*Sqrt[1 + x^2]*PolyLog[2, (I*Sqrt[1 + I*x])/Sqrt[1 - I*x]])/Sqrt[
a + a*x^2]
```

Rubi [A] time = 0.0718277, antiderivative size = 195, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {4879, 4891, 4887}

$$-\frac{ia\sqrt{x^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{2\sqrt{ax^2+a}}+\frac{ia\sqrt{x^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{2\sqrt{ax^2+a}}+\frac{1}{2}\sqrt{ax^2+a}+\frac{1}{2}x\sqrt{ax^2+a}\cot^{-1}(x)-\frac{ia\sqrt{x^2+1}\,\text{t}}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + a*x^2]*ArcCot[x],x]
```

```
[Out] Sqrt[a + a*x^2]/2 + (x*Sqrt[a + a*x^2]*ArcCot[x])/2 - (I*a*Sqrt[1 + x^2]*Ar
cCot[x]*ArcTan[Sqrt[1 + I*x]/Sqrt[1 - I*x]])/Sqrt[a + a*x^2] - ((I/2)*a*Sqr
t[1 + x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*x])/Sqrt[1 - I*x]])/Sqrt[a + a*x^2]
+ ((I/2)*a*Sqrt[1 + x^2]*PolyLog[2, (I*Sqrt[1 + I*x])/Sqrt[1 - I*x]])/Sqrt[
a + a*x^2]
```

Rule 4879

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q + 1
), Int[(d + e*x^2)^(q - 1)*(a + b*ArcCot[c*x]), x], x] + Simp[(x*(d + e*x^2
)^q*(a + b*ArcCot[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ
[e, c^2*d] && GtQ[q, 0]
```

Rule 4891

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcCot[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4887

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcCot[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (-Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*
c*x])])/(c*Sqrt[d]), x] + Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
 I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 GtQ[d, 0]
```

Rubi steps

$$\int \sqrt{a+ax^2}\cot^{-1}(x)\,dx = \frac{1}{2}\sqrt{a+ax^2}+\frac{1}{2}x\sqrt{a+ax^2}\cot^{-1}(x)+\frac{1}{2}a\int\frac{\cot^{-1}(x)}{\sqrt{a+ax^2}}\,dx$$

$$= \frac{1}{2}\sqrt{a+ax^2}+\frac{1}{2}x\sqrt{a+ax^2}\cot^{-1}(x)+\frac{\left(a\sqrt{1+x^2}\right)\int\frac{\cot^{-1}(x)}{\sqrt{1+x^2}}\,dx}{2\sqrt{a+ax^2}}$$

$$= \frac{1}{2}\sqrt{a+ax^2}+\frac{1}{2}x\sqrt{a+ax^2}\cot^{-1}(x)-\frac{ia\sqrt{1+x^2}\cot^{-1}(x)\tan^{-1}\left(\frac{\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{a+ax^2}}-\frac{ia\sqrt{1+x^2}\text{Li}_2\left(-\frac{i\sqrt{1}}{\sqrt{1}}\right.}{2\sqrt{a+ax^2}}$$

Mathematica [A] time = 1.11405, size = 136, normalized size = 0.7

$$-\frac{\left(a\left(x^2+1\right)\right)^{3/2}\left(4i\text{PolyLog}\left(2,-e^{i\cot^{-1}(x)}\right)-4i\text{PolyLog}\left(2,e^{i\cot^{-1}(x)}\right)-2\cot\left(\frac{1}{2}\cot^{-1}(x)\right)+4\cot^{-1}(x)\log\left(1-e^{i\cot^{-1}(x}\right.\right.}{8a\left(\frac{1}{x^2}+1\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[a + a*x^2]*ArcCot[x],x]
```

```
[Out] -((a*(1 + x^2))^(3/2)*(-2*Cot[ArcCot[x]/2] - ArcCot[x]*Csc[ArcCot[x]/2]^2 +
 4*ArcCot[x]*Log[1 - E^(I*ArcCot[x])] - 4*ArcCot[x]*Log[1 + E^(I*ArcCot[x])
] + (4*I)*PolyLog[2, -E^(I*ArcCot[x])] - (4*I)*PolyLog[2, E^(I*ArcCot[x])]
+ ArcCot[x]*Sec[ArcCot[x]/2]^2 - 2*Tan[ArcCot[x]/2]))/(8*a*(1 + x^(-2))^(3/
2)*x^3)
```

Maple [A] time = 0.7, size = 117, normalized size = 0.6

$$\frac{x\operatorname{arccot}(x)+1}{2}\sqrt{a(x+i)(x-i)}-\frac{i}{2}\sqrt{a(x+i)(x-i)}\left(i\operatorname{arccot}(x)\ln\left(1+(x+i)\frac{1}{\sqrt{x^2+1}}\right)-i\operatorname{arccot}(x)\ln\left(1-(x+i)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a*x^2+a)^(1/2)*arccot(x),x)
```

```
[Out] 1/2*(a*(x+I)*(x-I))^(1/2)*(x*arccot(x)+1)-1/2*I*(a*(x+I)*(x-I))^(1/2)*(I*ar
ccot(x)*ln(1+(x+I)/(x^2+1)^(1/2))-I*arccot(x)*ln(1-(x+I)/(x^2+1)^(1/2))+pol
ylog(2,-(x+I)/(x^2+1)^(1/2))-polylog(2,(x+I)/(x^2+1)^(1/2)))/(x^2+1)^(1/2)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x^2+a)^(1/2)*arccot(x),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{ax^2+a}\operatorname{arccot}(x),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x^2+a)^(1/2)*arccot(x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a*x^2 + a)*arccot(x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{a\left(x^2+1\right)}\operatorname{acot}(x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x**2+a)**(1/2)*acot(x),x)
```

```
[Out] Integral(sqrt(a*(x**2 + 1))*acot(x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ax^2 + a} \operatorname{arccot}(x) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a*x^2+a)^(1/2)*arccot(x),x, algorithm="giac")
```

```
[Out] integrate(sqrt(a*x^2 + a)*arccot(x), x)
```

3.66 $\int \frac{\cot^{-1}(x)}{\sqrt{a+ax^2}}\,dx$

Optimal. Leaf size=155

$$-\frac{i\sqrt{x^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{ax^2+a}}+\frac{i\sqrt{x^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{ax^2+a}}-\frac{2i\sqrt{x^2+1}\tan^{-1}\left(\frac{\sqrt{1+ix}}{\sqrt{1-ix}}\right)\cot^{-1}(x)}{\sqrt{ax^2+a}}$$

```
[Out] ((-2*I)*Sqrt[1 + x^2]*ArcCot[x]*ArcTan[Sqrt[1 + I*x]/Sqrt[1 - I*x]])/Sqrt[a
 + a*x^2] - (I*Sqrt[1 + x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*x])/Sqrt[1 - I*x]]
)/Sqrt[a + a*x^2] + (I*Sqrt[1 + x^2]*PolyLog[2, (I*Sqrt[1 + I*x])/Sqrt[1 -
I*x]])/Sqrt[a + a*x^2]
```

Rubi [A] time = 0.0447531, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4891, 4887}

$$-\frac{i\sqrt{x^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{ax^2+a}}+\frac{i\sqrt{x^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{ax^2+a}}-\frac{2i\sqrt{x^2+1}\tan^{-1}\left(\frac{\sqrt{1+ix}}{\sqrt{1-ix}}\right)\cot^{-1}(x)}{\sqrt{ax^2+a}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/Sqrt[a + a*x^2],x]
```

```
[Out] ((-2*I)*Sqrt[1 + x^2]*ArcCot[x]*ArcTan[Sqrt[1 + I*x]/Sqrt[1 - I*x]])/Sqrt[a
 + a*x^2] - (I*Sqrt[1 + x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*x])/Sqrt[1 - I*x]]
)/Sqrt[a + a*x^2] + (I*Sqrt[1 + x^2]*PolyLog[2, (I*Sqrt[1 + I*x])/Sqrt[1 -
I*x]])/Sqrt[a + a*x^2]
```

Rule 4891

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcCot[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4887

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcCot[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
```

```
/(c*Sqrt[d]), x] + (-Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*
c*x])])/(c*Sqrt[d]), x] + Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
 I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 GtQ[d, 0]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{\sqrt{a+ax^2}}\,dx = \frac{\sqrt{1+x^2}\int \frac{\cot^{-1}(x)}{\sqrt{1+x^2}}\,dx}{\sqrt{a+ax^2}}$$
$$= -\frac{2i\sqrt{1+x^2}\cot^{-1}(x)\tan^{-1}\left(\frac{\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{a+ax^2}} - \frac{i\sqrt{1+x^2}\,\mathrm{Li}_2\left(-\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{a+ax^2}} + \frac{i\sqrt{1+x^2}\,\mathrm{Li}_2\left(\frac{i\sqrt{1+ix}}{\sqrt{1-ix}}\right)}{\sqrt{a+ax^2}}$$

Mathematica [A] time = 0.102603, size = 89, normalized size = 0.57

$$-\frac{\sqrt{a\left(x^2+1\right)}\left(i\mathrm{PolyLog}\left(2,-e^{i\cot^{-1}(x)}\right)-i\mathrm{PolyLog}\left(2,e^{i\cot^{-1}(x)}\right)+\cot^{-1}(x)\left(\log\left(1-e^{i\cot^{-1}(x)}\right)-\log\left(1+e^{i\cot^{-1}(x)}\right)\right)\right)}{a\sqrt{\frac{1}{x^2}+1}x}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[x]/Sqrt[a + a*x^2],x]
```

```
[Out] -((Sqrt[a*(1 + x^2)]*(ArcCot[x]*(Log[1 - E^(I*ArcCot[x])] - Log[1 + E^(I*Ar
cCot[x])]) + I*PolyLog[2, -E^(I*ArcCot[x])] - I*PolyLog[2, E^(I*ArcCot[x])]
))/(a*Sqrt[1 + x^(-2)]*x))
```

Maple [A] time = 0.57, size = 99, normalized size = 0.6

$$\frac{i}{a}\left(i\mathrm{arccot}\,(x)\ln\left(1-(x+i)\frac{1}{\sqrt{x^2+1}}\right)-i\mathrm{arccot}\,(x)\ln\left(1+(x+i)\frac{1}{\sqrt{x^2+1}}\right)+\mathrm{polylog}\left(2,(x+i)\frac{1}{\sqrt{x^2+1}}\right)-\mathrm{polylog}\left(2,\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/(a*x^2+a)^(1/2),x)
```

```
[Out] I*(I*arccot(x)*ln(1-(x+I)/(x^2+1)^(1/2))-I*arccot(x)*ln(1+(x+I)/(x^2+1)^(1/
2))+polylog(2,(x+I)/(x^2+1)^(1/2))-polylog(2,-(x+I)/(x^2+1)^(1/2)))*(a*(x+I
```

```
)*(x-I))^(1/2)/(x^2+1)^(1/2)/a
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(x)}{\sqrt{ax^2+a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(arccot(x)/sqrt(a*x^2 + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(x)}{\sqrt{a\left(x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/(a*x**2+a)**(1/2),x)
```

```
[Out] Integral(acot(x)/sqrt(a*(x**2 + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{\sqrt{ax^2 + a}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arccot(x)/sqrt(a*x^2 + a), x)
```

3.67 $\int \frac{\cot^{-1}(x)}{(a+ax^2)^{3/2}}\,dx$

Optimal. Leaf size=35

$$\frac{x\cot^{-1}(x)}{a\sqrt{ax^2+a}}-\frac{1}{a\sqrt{ax^2+a}}$$

```
[Out] -(1/(a*Sqrt[a + a*x^2])) + (x*ArcCot[x])/(a*Sqrt[a + a*x^2])
```

Rubi [A] time = 0.0203738, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {4895}

$$\frac{x\cot^{-1}(x)}{a\sqrt{ax^2+a}}-\frac{1}{a\sqrt{ax^2+a}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(a + a*x^2)^(3/2),x]
```

```
[Out] -(1/(a*Sqrt[a + a*x^2])) + (x*ArcCot[x])/(a*Sqrt[a + a*x^2])
```

Rule 4895

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> -Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcCot[c*x]))/(d*S
qrt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{\left(a+ax^2\right)^{3/2}}\,dx=-\frac{1}{a\sqrt{a+ax^2}}+\frac{x\cot^{-1}(x)}{a\sqrt{a+ax^2}}$$

Mathematica [A] time = 0.0227613, size = 21, normalized size = 0.6

$$\frac{x\cot^{-1}(x)-1}{a\sqrt{a\left(x^2+1\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(a + a*x^2)^(3/2),x]
```

```
[Out] (-1 + x*ArcCot[x])/(a*Sqrt[a*(1 + x^2)])
```

Maple [C] time = 0.381, size = 68, normalized size = 1.9

$$\frac{(\operatorname{arccot}(x)+i)(x+i)}{(2x^2+2)a^2}\sqrt{a(x+i)(x-i)}+\frac{(x-i)(\operatorname{arccot}(x)-i)}{(2x^2+2)a^2}\sqrt{a(x+i)(x-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/(a*x^2+a)^(3/2),x)
```

```
[Out] 1/2*(arccot(x)+I)*(x+I)*(a*(x+I)*(x-I))^(1/2)/(x^2+1)/a^2+1/2*(a*(x+I)*(x-I
))^(1/2)*(x-I)*(arccot(x)-I)/(x^2+1)/a^2
```

Maxima [A] time = 1.46939, size = 42, normalized size = 1.2

$$\frac{x\operatorname{arccot}(x)}{\sqrt{ax^2+a}a}-\frac{1}{\sqrt{ax^2+a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(3/2),x, algorithm="maxima")
```

```
[Out] x*arccot(x)/(sqrt(a*x^2 + a)*a) - 1/(sqrt(a*x^2 + a)*a)
```

Fricas [A] time = 2.11805, size = 69, normalized size = 1.97

$$\frac{\sqrt{ax^2+a}(x\operatorname{arccot}(x)-1)}{a^2x^2+a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(a*x^2 + a)*(x*arccot(x) - 1)/(a^2*x^2 + a^2)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(x)}{\left(a\left(x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/(a*x**2+a)**(3/2),x)
```

```
[Out] Integral(acot(x)/(a*(x**2 + 1))**(3/2), x)
```

Giac [A] time = 1.14389, size = 45, normalized size = 1.29

$$\frac{x\arctan\left(\frac{1}{x}\right)}{\sqrt{ax^2+a}a}-\frac{1}{\sqrt{ax^2+a}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(3/2),x, algorithm="giac")
```

```
[Out] x*arctan(1/x)/(sqrt(a*x^2 + a)*a) - 1/(sqrt(a*x^2 + a)*a)
```

3.68 $\int \frac{\cot^{-1}(x)}{(a+ax^2)^{5/2}}\,dx$

Optimal. Leaf size=79

$$-\frac{2}{3a^2\sqrt{ax^2+a}}+\frac{2x\cot^{-1}(x)}{3a^2\sqrt{ax^2+a}}-\frac{1}{9a\left(ax^2+a\right)^{3/2}}+\frac{x\cot^{-1}(x)}{3a\left(ax^2+a\right)^{3/2}}$$

```
[Out] -1/(9*a*(a + a*x^2)^(3/2)) - 2/(3*a^2*Sqrt[a + a*x^2]) + (x*ArcCot[x])/(3*a
*(a + a*x^2)^(3/2)) + (2*x*ArcCot[x])/(3*a^2*Sqrt[a + a*x^2])
```

Rubi [A] time = 0.0440098, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4897, 4895}

$$-\frac{2}{3a^2\sqrt{ax^2+a}}+\frac{2x\cot^{-1}(x)}{3a^2\sqrt{ax^2+a}}-\frac{1}{9a\left(ax^2+a\right)^{3/2}}+\frac{x\cot^{-1}(x)}{3a\left(ax^2+a\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(a + a*x^2)^(5/2),x]
```


```
[Out] -1/(9*a*(a + a*x^2)^(3/2)) - 2/(3*a^2*Sqrt[a + a*x^2]) + (x*ArcCot[x])/(3*a
*(a + a*x^2)^(3/2)) + (2*x*ArcCot[x])/(3*a^2*Sqrt[a + a*x^2])
```


Rule 4897

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/
(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x]), x], x] - Simp[(
x*(d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a,
b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4895

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> -Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcCot[c*x]))/(d*S
qrt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{(a+ax^2)^{5/2}}\,dx = -\frac{1}{9a(a+ax^2)^{3/2}} + \frac{x\cot^{-1}(x)}{3a(a+ax^2)^{3/2}} + \frac{2\int \frac{\cot^{-1}(x)}{(a+ax^2)^{3/2}}\,dx}{3a}$$

$$= -\frac{1}{9a(a+ax^2)^{3/2}} - \frac{2}{3a^2\sqrt{a+ax^2}} + \frac{x\cot^{-1}(x)}{3a(a+ax^2)^{3/2}} + \frac{2x\cot^{-1}(x)}{3a^2\sqrt{a+ax^2}}$$

Mathematica [A] time = 0.0305638, size = 37, normalized size = 0.47

$$\frac{-6x^2+(6x^3+9x)\cot^{-1}(x)-7}{9a(a(x^2+1))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(a + a*x^2)^(5/2),x]
```

```
[Out] (-7 - 6*x^2 + (9*x + 6*x^3)*ArcCot[x])/(9*a*(a*(1 + x^2))^(3/2))
```

Maple [C] time = 0.386, size = 165, normalized size = 2.1

$$-\frac{(i+3\,\mathrm{arccot}(x))(3ix^2+x^3-i-3x)}{72(x^2+1)^2a^3}\sqrt{a(x+i)(x-i)} + \frac{(3\,\mathrm{arccot}(x)+3i)(x+i)}{8a^3(x^2+1)}\sqrt{a(x+i)(x-i)} + \frac{(3x-3i)(\mathrm{arc}}{8a^3(x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/(a*x^2+a)^(5/2),x)
```

```
[Out] -1/72*(I+3*arccot(x))*(3*I*x^2+x^3-I-3*x)*(a*(x+I)*(x-I))^(1/2)/(x^2+1)^2/a
^3+3/8*(arccot(x)+I)*(x+I)*(a*(x+I)*(x-I))^(1/2)/a^3/(x^2+1)+3/8*(a*(x+I)*(
x-I))^(1/2)*(x-I)*(arccot(x)-I)/a^3/(x^2+1)-1/72*(-I+3*arccot(x))*(a*(x+I)*
(x-I))^(1/2)*(-3*x-3*I*x^2+x^3+I)/(x^4+2*x^2+1)/a^3
```

Maxima [A] time = 1.45611, size = 85, normalized size = 1.08

$$\frac{1}{3}\left(\frac{2x}{\sqrt{ax^2+a}a^2} + \frac{x}{(ax^2+a)^{\frac{3}{2}}a}\right)\mathrm{arccot}(x) - \frac{2}{3\sqrt{ax^2+a}a^2} - \frac{1}{9(ax^2+a)^{\frac{3}{2}}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*(2*x/(sqrt(a*x^2 + a)*a^2) + x/((a*x^2 + a)^(3/2)*a))*arccot(x) - 2/3/(
sqrt(a*x^2 + a)*a^2) - 1/9/((a*x^2 + a)^(3/2)*a)
```

Fricas [A] time = 2.20266, size = 122, normalized size = 1.54

$$-\frac{\sqrt{ax^2+a}\left(6x^2-3\left(2x^3+3x\right)\operatorname{arccot}(x)+7\right)}{9\left(a^3x^4+2a^3x^2+a^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/9*sqrt(a*x^2 + a)*(6*x^2 - 3*(2*x^3 + 3*x)*arccot(x) + 7)/(a^3*x^4 + 2*a
^3*x^2 + a^3)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(x)}{\left(a\left(x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/(a*x**2+a)**(5/2),x)
```

```
[Out] Integral(acot(x)/(a*(x**2 + 1))**(5/2), x)
```

Giac [A] time = 1.14799, size = 74, normalized size = 0.94

$$\frac{x\left(\frac{2x^2}{a}+\frac{3}{a}\right)\arctan\left(\frac{1}{x}\right)}{3\left(ax^2+a\right)^{\frac{3}{2}}}-\frac{6ax^2+7a}{9\left(ax^2+a\right)^{\frac{3}{2}}a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(5/2),x, algorithm="giac")
```

```
[Out] 1/3*x*(2*x^2/a + 3/a)*arctan(1/x)/(a*x^2 + a)^(3/2) - 1/9*(6*a*x^2 + 7*a)/(
(a*x^2 + a)^(3/2)*a^2)
```

3.69 $\int \frac{\cot^{-1}(x)}{(a+ax^2)^{7/2}}\,dx$

Optimal. Leaf size=118

$$-\frac{8}{15a^3\sqrt{ax^2+a}}-\frac{4}{45a^2\left(ax^2+a\right)^{3/2}}+\frac{8x\cot^{-1}(x)}{15a^3\sqrt{ax^2+a}}+\frac{4x\cot^{-1}(x)}{15a^2\left(ax^2+a\right)^{3/2}}-\frac{1}{25a\left(ax^2+a\right)^{5/2}}+\frac{x\cot^{-1}(x)}{5a\left(ax^2+a\right)^{5/2}}$$

```
[Out] -1/(25*a*(a + a*x^2)^(5/2)) - 4/(45*a^2*(a + a*x^2)^(3/2)) - 8/(15*a^3*Sqrt
[a + a*x^2]) + (x*ArcCot[x])/(5*a*(a + a*x^2)^(5/2)) + (4*x*ArcCot[x])/(15*
a^2*(a + a*x^2)^(3/2)) + (8*x*ArcCot[x])/(15*a^3*Sqrt[a + a*x^2])
```

Rubi [A] time = 0.0670812, antiderivative size = 118, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4897, 4895}

$$-\frac{8}{15a^3\sqrt{ax^2+a}}-\frac{4}{45a^2\left(ax^2+a\right)^{3/2}}+\frac{8x\cot^{-1}(x)}{15a^3\sqrt{ax^2+a}}+\frac{4x\cot^{-1}(x)}{15a^2\left(ax^2+a\right)^{3/2}}-\frac{1}{25a\left(ax^2+a\right)^{5/2}}+\frac{x\cot^{-1}(x)}{5a\left(ax^2+a\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(a + a*x^2)^(7/2),x]
```

```
[Out] -1/(25*a*(a + a*x^2)^(5/2)) - 4/(45*a^2*(a + a*x^2)^(3/2)) - 8/(15*a^3*Sqrt
[a + a*x^2]) + (x*ArcCot[x])/(5*a*(a + a*x^2)^(5/2)) + (4*x*ArcCot[x])/(15*
a^2*(a + a*x^2)^(3/2)) + (8*x*ArcCot[x])/(15*a^3*Sqrt[a + a*x^2])
```

Rule 4897

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/
(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x]), x], x] - Simp[(
x*(d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a,
b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4895

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> -Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcCot[c*x]))/(d*S
qrt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{\left(a+ax^2\right)^{7/2}}\,dx = -\frac{1}{25a\left(a+ax^2\right)^{5/2}}+\frac{x\cot^{-1}(x)}{5a\left(a+ax^2\right)^{5/2}}+\frac{4\int \frac{\cot^{-1}(x)}{\left(a+ax^2\right)^{5/2}}\,dx}{5a}$$

$$= -\frac{1}{25a\left(a+ax^2\right)^{5/2}}-\frac{4}{45a^2\left(a+ax^2\right)^{3/2}}+\frac{x\cot^{-1}(x)}{5a\left(a+ax^2\right)^{5/2}}+\frac{4x\cot^{-1}(x)}{15a^2\left(a+ax^2\right)^{3/2}}+\frac{8\int \frac{\cot^{-1}(x)}{\left(a+ax^2\right)^{3/2}}\,dx}{15a^2}$$

$$= -\frac{1}{25a\left(a+ax^2\right)^{5/2}}-\frac{4}{45a^2\left(a+ax^2\right)^{3/2}}-\frac{8}{15a^3\sqrt{a+ax^2}}+\frac{x\cot^{-1}(x)}{5a\left(a+ax^2\right)^{5/2}}+\frac{4x\cot^{-1}(x)}{15a^2\left(a+ax^2\right)^{3/2}}+\frac{8}{15}$$

Mathematica [A] time = 0.0378354, size = 47, normalized size = 0.4

$$\frac{-120x^4-260x^2+15\left(8x^4+20x^2+15\right)x\cot^{-1}(x)-149}{225a\left(a\left(x^2+1\right)\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(a + a*x^2)^(7/2),x]
```

```
[Out] (-149 - 260*x^2 - 120*x^4 + 15*x*(15 + 20*x^2 + 8*x^4)*ArcCot[x])/(225*a*(a
*(1 + x^2))^(5/2))
```

Maple [C] time = 0.455, size = 289, normalized size = 2.5

$$\frac{(i+5\,\mathrm{arccot}\,(x))\left(5\,ix^4+x^5-10\,ix^2-10\,x^3+i+5\,x\right)}{800\,\left(x^2+1\right)^3a^4}\sqrt{a\,(x+i)\,(x-i)}-\frac{(5\,i+15\,\mathrm{arccot}\,(x))\left(3\,ix^2+x^3-i-3\,x\right)}{288\,a^4\left(x^2+1\right)^2}\sqrt{a\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/(a*x^2+a)^(7/2),x)
```

```
[Out] 1/800*(I+5*arccot(x))*(5*I*x^4+x^5-10*I*x^2-10*x^3+I+5*x)*(a*(x+I)*(x-I))^(
1/2)/(x^2+1)^3/a^4-5/288*(I+3*arccot(x))*(3*I*x^2+x^3-I-3*x)*(a*(x+I)*(x-I)
)^(1/2)/a^4/(x^2+1)^2+5/16*(arccot(x)+I)*(x+I)*(a*(x+I)*(x-I))^(1/2)/(x^2+1
```

```
)/a^4+5/16*(a*(x+I)*(x-I))^(1/2)*(x-I)*(arccot(x)-I)/(x^2+1)/a^4-5/288*(-I+
3*arccot(x))*(a*(x+I)*(x-I))^(1/2)*(-3*x-3*I*x^2+x^3+I)/(x^4+2*x^2+1)/a^4+1
/800*(-I+5*arccot(x))*(a*(x+I)*(x-I))^(1/2)*(-10*x^3-5*I*x^4+x^5+5*x+10*I*x
^2-I)/(x^6+3*x^4+3*x^2+1)/a^4
```

Maxima [A] time = 1.53891, size = 126, normalized size = 1.07

$$\frac{1}{15}\left(\frac{8\,x}{\sqrt{ax^2+a}a^3}+\frac{4\,x}{\left(ax^2+a\right)^{\frac{3}{2}}a^2}+\frac{3\,x}{\left(ax^2+a\right)^{\frac{5}{2}}a}\right)\operatorname{arccot}\left(x\right)-\frac{8}{15\,\sqrt{ax^2+a}a^3}-\frac{4}{45\left(ax^2+a\right)^{\frac{3}{2}}a^2}-\frac{1}{25\left(ax^2+a\right)^{\frac{5}{2}}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(7/2),x, algorithm="maxima")
```

```
[Out] 1/15*(8*x/(sqrt(a*x^2 + a)*a^3) + 4*x/((a*x^2 + a)^(3/2)*a^2) + 3*x/((a*x^2
 + a)^(5/2)*a))*arccot(x) - 8/15/(sqrt(a*x^2 + a)*a^3) - 4/45/((a*x^2 + a)^
(3/2)*a^2) - 1/25/((a*x^2 + a)^(5/2)*a)
```

Fricas [A] time = 2.19193, size = 174, normalized size = 1.47

$$-\frac{\left(120\,x^4+260\,x^2-15\left(8\,x^5+20\,x^3+15\,x\right)\operatorname{arccot}\left(x\right)+149\right)\sqrt{ax^2+a}}{225\left(a^4x^6+3\,a^4x^4+3\,a^4x^2+a^4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(7/2),x, algorithm="fricas")
```

```
[Out] -1/225*(120*x^4 + 260*x^2 - 15*(8*x^5 + 20*x^3 + 15*x)*arccot(x) + 149)*sqr
t(a*x^2 + a)/(a^4*x^6 + 3*a^4*x^4 + 3*a^4*x^2 + a^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/(a*x**2+a)**(7/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.14537, size = 112, normalized size = 0.95

$$\frac{\left(4\,x^2\left(\frac{2\,x^2}{a}+\frac{5}{a}\right)+\frac{15}{a}\right)x\arctan\left(\frac{1}{x}\right)}{15\left(ax^2+a\right)^{\frac{5}{2}}}-\frac{120\left(ax^2+a\right)^2+20\left(ax^2+a\right)a+9\,a^2}{225\left(ax^2+a\right)^{\frac{5}{2}}a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(a*x^2+a)^(7/2),x, algorithm="giac")
```

```
[Out] 1/15*(4*x^2*(2*x^2/a + 5/a) + 15/a)*x*arctan(1/x)/(a*x^2 + a)^(5/2) - 1/225
*(120*(a*x^2 + a)^2 + 20*(a*x^2 + a)*a + 9*a^2)/((a*x^2 + a)^(5/2)*a^3)
```

3.70 $\int \frac{x \cot^{-1}(x)}{(1+x^2)^2} \, dx$

Optimal. Leaf size=32

$$-\frac{x}{4(x^2+1)} - \frac{\cot^{-1}(x)}{2(x^2+1)} - \frac{1}{4}\tan^{-1}(x)$$

```
[Out] -x/(4*(1 + x^2)) - ArcCot[x]/(2*(1 + x^2)) - ArcTan[x]/4
```

Rubi [A] time = 0.0261825, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4931, 199, 203}

$$-\frac{x}{4(x^2+1)} - \frac{\cot^{-1}(x)}{2(x^2+1)} - \frac{1}{4}\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcCot[x])/(1 + x^2)^2,x]
```

```
[Out] -x/(4*(1 + x^2)) - ArcCot[x]/(2*(1 + x^2)) - ArcTan[x]/4
```

Rule 4931

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x])^p)/(2*e*(q +
 1)), x] + Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcCot[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{x\cot^{-1}(x)}{\left(1+x^2\right)^2}\,dx &= -\frac{\cot^{-1}(x)}{2\left(1+x^2\right)}-\frac{1}{2}\int \frac{1}{\left(1+x^2\right)^2}\,dx\\ &= -\frac{x}{4\left(1+x^2\right)}-\frac{\cot^{-1}(x)}{2\left(1+x^2\right)}-\frac{1}{4}\int \frac{1}{1+x^2}\,dx\\ &= -\frac{x}{4\left(1+x^2\right)}-\frac{\cot^{-1}(x)}{2\left(1+x^2\right)}-\frac{1}{4}\tan^{-1}(x)\end{aligned}$$

Mathematica [A] time = 0.0183403, size = 25, normalized size = 0.78

$$-\frac{x^2\tan^{-1}(x)+x+\tan^{-1}(x)+2\cot^{-1}(x)}{4x^2+4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcCot[x])/(1 + x^2)^2,x]
```

```
[Out] -((x + 2*ArcCot[x] + ArcTan[x] + x^2*ArcTan[x])/(4 + 4*x^2))
```

Maple [A] time = 0.026, size = 27, normalized size = 0.8

$$-\frac{x}{4\,x^2+4}-\frac{\operatorname{arccot}(x)}{2\,x^2+2}-\frac{\arctan(x)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(x)/(x^2+1)^2,x)
```

```
[Out] -1/4*x/(x^2+1)-1/2*arccot(x)/(x^2+1)-1/4*arctan(x)
```

Maxima [A] time = 1.48701, size = 35, normalized size = 1.09

$$-\frac{x}{4\left(x^2+1\right)}-\frac{\operatorname{arccot}(x)}{2\left(x^2+1\right)}-\frac{1}{4}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1)^2,x, algorithm="maxima")
```

```
[Out] -1/4*x/(x^2 + 1) - 1/2*arccot(x)/(x^2 + 1) - 1/4*arctan(x)
```

Fricas [A] time = 2.14481, size = 55, normalized size = 1.72

$$\frac{\left(x^2-1\right)\operatorname{arccot}(x)-x}{4\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1)^2,x, algorithm="fricas")
```

```
[Out] 1/4*((x^2 - 1)*arccot(x) - x)/(x^2 + 1)
```

Sympy [A] time = 0.70656, size = 31, normalized size = 0.97

$$\frac{x^2\operatorname{acot}(x)}{4x^2+4}-\frac{x}{4x^2+4}-\frac{\operatorname{acot}(x)}{4x^2+4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(x)/(x**2+1)**2,x)
```

```
[Out] x**2*acot(x)/(4*x**2 + 4) - x/(4*x**2 + 4) - acot(x)/(4*x**2 + 4)
```

Giac [A] time = 1.10231, size = 38, normalized size = 1.19

$$-\frac{x}{4\left(x^2+1\right)}-\frac{\arctan\left(\frac{1}{x}\right)}{2\left(x^2+1\right)}-\frac{1}{4}\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1)^2,x, algorithm="giac")
```

```
[Out] -1/4*x/(x^2 + 1) - 1/2*arctan(1/x)/(x^2 + 1) - 1/4*arctan(x)
```

3.71 $\int \frac{x\cot^{-1}(x)}{(1+x^2)^3}\,dx$

Optimal. Leaf size=44

$$-\frac{3x}{32\left(x^2+1\right)}-\frac{x}{16\left(x^2+1\right)^2}-\frac{\cot^{-1}(x)}{4\left(x^2+1\right)^2}-\frac{3}{32}\tan^{-1}(x)$$

```
[Out] -x/(16*(1 + x^2)^2) - (3*x)/(32*(1 + x^2)) - ArcCot[x]/(4*(1 + x^2)^2) - (3
*ArcTan[x])/32
```

Rubi [A] time = 0.0288825, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4931, 199, 203}

$$-\frac{3x}{32\left(x^2+1\right)}-\frac{x}{16\left(x^2+1\right)^2}-\frac{\cot^{-1}(x)}{4\left(x^2+1\right)^2}-\frac{3}{32}\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcCot[x])/(1 + x^2)^3,x]
```

```
[Out] -x/(16*(1 + x^2)^2) - (3*x)/(32*(1 + x^2)) - ArcCot[x]/(4*(1 + x^2)^2) - (3
*ArcTan[x])/32
```

Rule 4931

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x])^p)/(2*e*(q +
 1)), x] + Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcCot[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{x\cot^{-1}(x)}{\left(1+x^2\right)^3}\,dx &= -\frac{\cot^{-1}(x)}{4\left(1+x^2\right)^2}-\frac{1}{4}\int \frac{1}{\left(1+x^2\right)^3}\,dx\\
&= -\frac{x}{16\left(1+x^2\right)^2}-\frac{\cot^{-1}(x)}{4\left(1+x^2\right)^2}-\frac{3}{16}\int \frac{1}{\left(1+x^2\right)^2}\,dx\\
&= -\frac{x}{16\left(1+x^2\right)^2}-\frac{3x}{32\left(1+x^2\right)}-\frac{\cot^{-1}(x)}{4\left(1+x^2\right)^2}-\frac{3}{32}\int \frac{1}{1+x^2}\,dx\\
&= -\frac{x}{16\left(1+x^2\right)^2}-\frac{3x}{32\left(1+x^2\right)}-\frac{\cot^{-1}(x)}{4\left(1+x^2\right)^2}-\frac{3}{32}\tan^{-1}(x)
\end{aligned}
$$

Mathematica [A] time = 0.021473, size = 36, normalized size = 0.82

$$
-\frac{x\left(3x^2+5\right)+3\left(x^2+1\right)^2\tan^{-1}(x)+8\cot^{-1}(x)}{32\left(x^2+1\right)^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcCot[x])/(1 + x^2)^3,x]
```

```
[Out] -(x*(5 + 3*x^2) + 8*ArcCot[x] + 3*(1 + x^2)^2*ArcTan[x])/(32*(1 + x^2)^2)
```

Maple [A] time = 0.025, size = 37, normalized size = 0.8

$$
-\frac{x}{16\left(x^2+1\right)^2}-\frac{3\,x}{32\,x^2+32}-\frac{\operatorname{arccot}(x)}{4\left(x^2+1\right)^2}-\frac{3\arctan(x)}{32}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(x)/(x^2+1)^3,x)
```

```
[Out] -1/16*x/(x^2+1)^2-3/32*x/(x^2+1)-1/4*arccot(x)/(x^2+1)^2-3/32*arctan(x)
```

Maxima [A] time = 1.47224, size = 53, normalized size = 1.2

$$-\frac{3\,x^3+5\,x}{32\left(x^4+2\,x^2+1\right)}-\frac{\operatorname{arccot}(x)}{4\left(x^2+1\right)^2}-\frac{3}{32}\,\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1)^3,x, algorithm="maxima")
```

```
[Out] -1/32*(3*x^3 + 5*x)/(x^4 + 2*x^2 + 1) - 1/4*arccot(x)/(x^2 + 1)^2 - 3/32*ar
ctan(x)
```

Fricas [A] time = 2.10158, size = 96, normalized size = 2.18

$$-\frac{3\,x^3-\left(3\,x^4+6\,x^2-5\right)\operatorname{arccot}(x)+5\,x}{32\left(x^4+2\,x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1)^3,x, algorithm="fricas")
```

```
[Out] -1/32*(3*x^3 - (3*x^4 + 6*x^2 - 5)*arccot(x) + 5*x)/(x^4 + 2*x^2 + 1)
```

Sympy [B] time = 1.20351, size = 88, normalized size = 2.

$$\frac{3x^4\operatorname{acot}(x)}{32x^4+64x^2+32}-\frac{3x^3}{32x^4+64x^2+32}+\frac{6x^2\operatorname{acot}(x)}{32x^4+64x^2+32}-\frac{5x}{32x^4+64x^2+32}-\frac{5\operatorname{acot}(x)}{32x^4+64x^2+32}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(x)/(x**2+1)**3,x)
```

```
[Out] 3*x**4*acot(x)/(32*x**4 + 64*x**2 + 32) - 3*x**3/(32*x**4 + 64*x**2 + 32) +
 6*x**2*acot(x)/(32*x**4 + 64*x**2 + 32) - 5*x/(32*x**4 + 64*x**2 + 32) - 5
*acot(x)/(32*x**4 + 64*x**2 + 32)
```

Giac [A] time = 1.11184, size = 49, normalized size = 1.11

$$-\frac{3\,x^3+5\,x}{32\left(x^2+1\right)^2}-\frac{\arctan\left(\frac{1}{x}\right)}{4\left(x^2+1\right)^2}-\frac{3}{32}\,\arctan\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x)/(x^2+1)^3,x, algorithm="giac")
```

```
[Out] -1/32*(3*x^3 + 5*x)/(x^2 + 1)^2 - 1/4*arctan(1/x)/(x^2 + 1)^2 - 3/32*arctan
(x)
```

3.72 $\int \frac{\cot^{-1}(x)}{(1+x^2)^2} dx$

Optimal. Leaf size=34

$$-\frac{1}{4(x^2+1)}+\frac{x\cot^{-1}(x)}{2(x^2+1)}-\frac{1}{4}\cot^{-1}(x)^2$$

```
[Out] -1/(4*(1 + x^2)) + (x*ArcCot[x])/(2*(1 + x^2)) - ArcCot[x]^2/4
```

Rubi [A] time = 0.0145949, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {4893, 261}

$$-\frac{1}{4(x^2+1)}+\frac{x\cot^{-1}(x)}{2(x^2+1)}-\frac{1}{4}\cot^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]/(1 + x^2)^2,x]
```

```
[Out] -1/(4*(1 + x^2)) + (x*ArcCot[x])/(2*(1 + x^2)) - ArcCot[x]^2/4
```

Rule 4893

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcCot[c*x])^p)/(2*d*(d + e*x^2)), x] + (Dist[(b*c*p
)/2, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(d + e*x^2)^2, x], x] - Simp[(a +
b*ArcCot[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rubi steps

$$\int \frac{\cot^{-1}(x)}{\left(1+x^2\right)^2}\,dx = \frac{x\cot^{-1}(x)}{2\left(1+x^2\right)} - \frac{1}{4}\cot^{-1}(x)^2 + \frac{1}{2}\int \frac{x}{\left(1+x^2\right)^2}\,dx$$
$$= -\frac{1}{4\left(1+x^2\right)} + \frac{x\cot^{-1}(x)}{2\left(1+x^2\right)} - \frac{1}{4}\cot^{-1}(x)^2$$

Mathematica [A] time = 0.0127626, size = 28, normalized size = 0.82

$$-\frac{\left(x^2+1\right)\cot^{-1}(x)^2 - 2x\cot^{-1}(x) + 1}{4\left(x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]/(1 + x^2)^2,x]
```

```
[Out] -(1 - 2*x*ArcCot[x] + (1 + x^2)*ArcCot[x]^2)/(4*(1 + x^2))
```

Maple [A] time = 0.034, size = 35, normalized size = 1.

$$\frac{x\operatorname{arccot}(x)}{2x^2+2} + \frac{\operatorname{arccot}(x)\arctan(x)}{2} - \frac{1}{4x^2+4} + \frac{(\arctan(x))^2}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)/(x^2+1)^2,x)
```

```
[Out] 1/2*x*arccot(x)/(x^2+1)+1/2*arccot(x)*arctan(x)-1/4/(x^2+1)+1/4*arctan(x)^2
```

Maxima [A] time = 1.46364, size = 51, normalized size = 1.5

$$\frac{1}{2}\left(\frac{x}{x^2+1} + \arctan(x)\right)\operatorname{arccot}(x) + \frac{\left(x^2+1\right)\arctan(x)^2 - 1}{4\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(x^2+1)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(x^2 + 1) + arctan(x))*arccot(x) + 1/4*((x^2 + 1)*arctan(x)^2 - 1)/(
x^2 + 1)
```

Fricas [A] time = 2.1514, size = 81, normalized size = 2.38

$$-\frac{\left(x^2+1\right)\operatorname{arccot}(x)^2-2\,x\operatorname{arccot}(x)+1}{4\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(x^2+1)^2,x, algorithm="fricas")
```

```
[Out] -1/4*((x^2 + 1)*arccot(x)^2 - 2*x*arccot(x) + 1)/(x^2 + 1)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(x)}{\left(x^2+1\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)/(x**2+1)**2,x)
```

```
[Out] Integral(acot(x)/(x**2 + 1)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)}{\left(x^2+1\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)/(x^2+1)^2,x, algorithm="giac")
```

```
[Out] integrate(arccot(x)/(x^2 + 1)^2, x)
```

3.73 $\int \frac{\cot^{-1}(x)^2}{(1+x^2)^2} dx$

Optimal. Leaf size=56

$$-\frac{x}{4(x^2+1)}+\frac{x\cot^{-1}(x)^2}{2(x^2+1)}-\frac{\cot^{-1}(x)}{2(x^2+1)}-\frac{1}{4}\tan^{-1}(x)-\frac{1}{6}\cot^{-1}(x)^3$$

```
[Out] -x/(4*(1 + x^2)) - ArcCot[x]/(2*(1 + x^2)) + (x*ArcCot[x]^2)/(2*(1 + x^2))
- ArcCot[x]^3/6 - ArcTan[x]/4
```

Rubi [A] time = 0.0438201, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4893, 4931, 199, 203}

$$-\frac{x}{4(x^2+1)}+\frac{x\cot^{-1}(x)^2}{2(x^2+1)}-\frac{\cot^{-1}(x)}{2(x^2+1)}-\frac{1}{4}\tan^{-1}(x)-\frac{1}{6}\cot^{-1}(x)^3$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x]^2/(1 + x^2)^2,x]
```

```
[Out] -x/(4*(1 + x^2)) - ArcCot[x]/(2*(1 + x^2)) + (x*ArcCot[x]^2)/(2*(1 + x^2))
- ArcCot[x]^3/6 - ArcTan[x]/4
```

Rule 4893

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcCot[c*x])^p)/(2*d*(d + e*x^2)), x] + (Dist[(b*c*p
)/2, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(d + e*x^2)^2, x], x] - Simp[(a +
b*ArcCot[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e}, x
] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4931

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcCot[c*x])^p)/(2*e*(q +
 1)), x] + Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcCot[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}(x)^2}{\left(1+x^2\right)^2}\,dx &= \frac{x\cot^{-1}(x)^2}{2\left(1+x^2\right)}-\frac{1}{6}\cot^{-1}(x)^3+\int \frac{x\cot^{-1}(x)}{\left(1+x^2\right)^2}\,dx\\
&= -\frac{\cot^{-1}(x)}{2\left(1+x^2\right)}+\frac{x\cot^{-1}(x)^2}{2\left(1+x^2\right)}-\frac{1}{6}\cot^{-1}(x)^3-\frac{1}{2}\int \frac{1}{\left(1+x^2\right)^2}\,dx\\
&= -\frac{x}{4\left(1+x^2\right)}-\frac{\cot^{-1}(x)}{2\left(1+x^2\right)}+\frac{x\cot^{-1}(x)^2}{2\left(1+x^2\right)}-\frac{1}{6}\cot^{-1}(x)^3-\frac{1}{4}\int \frac{1}{1+x^2}\,dx\\
&= -\frac{x}{4\left(1+x^2\right)}-\frac{\cot^{-1}(x)}{2\left(1+x^2\right)}+\frac{x\cot^{-1}(x)^2}{2\left(1+x^2\right)}-\frac{1}{6}\cot^{-1}(x)^3-\frac{1}{4}\tan^{-1}(x)
\end{aligned}$$

Mathematica [A] time = 0.0235425, size = 46, normalized size = 0.82

$$-\frac{3\left(\left(x^2+1\right)\tan^{-1}(x)+x\right)+2\left(x^2+1\right)\cot^{-1}(x)^3-6x\cot^{-1}(x)^2+6\cot^{-1}(x)}{12\left(x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x]^2/(1 + x^2)^2,x]
```

```
[Out] -(6*ArcCot[x] - 6*x*ArcCot[x]^2 + 2*(1 + x^2)*ArcCot[x]^3 + 3*(x + (1 + x^2
)*ArcTan[x]))/(12*(1 + x^2))
```

Maple [A] time = 0.169, size = 61, normalized size = 1.1

$$-\frac{(\operatorname{arccot}(x))^2 \left(x^2 \operatorname{arccot}(x) + \operatorname{arccot}(x) - x\right)}{2x^2+2} + \frac{x^2 \operatorname{arccot}(x)}{2x^2+2} - \frac{x}{4x^2+4} - \frac{\operatorname{arccot}(x)}{4} + \frac{(\operatorname{arccot}(x))^3}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x)^2/(x^2+1)^2,x)
```

```
[Out] -1/2*arccot(x)^2*(x^2*arccot(x)+arccot(x)-x)/(x^2+1)+1/2*x^2*arccot(x)/(x^2
+1)-1/4*x/(x^2+1)-1/4*arccot(x)+1/3*arccot(x)^3
```

Maxima [A] time = 1.52471, size = 101, normalized size = 1.8

$$\frac{1}{2}\left(\frac{x}{x^2+1} + \arctan(x)\right)\operatorname{arccot}(x)^2 + \frac{\left(\left(x^2+1\right)\arctan(x)^2 - 1\right)\operatorname{arccot}(x)}{2\left(x^2+1\right)} + \frac{2\left(x^2+1\right)\arctan(x)^3 - 3\left(x^2+1\right)\operatorname{arcta}}{12\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)^2/(x^2+1)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(x^2 + 1) + arctan(x))*arccot(x)^2 + 1/2*((x^2 + 1)*arctan(x)^2 - 1)
*arccot(x)/(x^2 + 1) + 1/12*(2*(x^2 + 1)*arctan(x)^3 - 3*(x^2 + 1)*arctan(x
) - 3*x)/(x^2 + 1)
```

Fricas [A] time = 2.08247, size = 123, normalized size = 2.2

$$-\frac{2\left(x^2+1\right)\operatorname{arccot}(x)^3 - 6x\operatorname{arccot}(x)^2 - 3\left(x^2-1\right)\operatorname{arccot}(x) + 3x}{12\left(x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)^2/(x^2+1)^2,x, algorithm="fricas")
```

```
[Out] -1/12*(2*(x^2 + 1)*arccot(x)^3 - 6*x*arccot(x)^2 - 3*(x^2 - 1)*arccot(x) +
3*x)/(x^2 + 1)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}^{2}(x)}{\left(x^{2}+1\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x)**2/(x**2+1)**2,x)
```

```
[Out] Integral(acot(x)**2/(x**2 + 1)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x)^{2}}{\left(x^{2}+1\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x)^2/(x^2+1)^2,x, algorithm="giac")
```

```
[Out] integrate(arccot(x)^2/(x^2 + 1)^2, x)
```

3.74 $\int x^5 \cot^{-1}\left(ax^2\right) dx$

Optimal. Leaf size=41

$$-\frac{\log\left(a^2x^4+1\right)}{12a^3}+\frac{x^4}{12a}+\frac{1}{6}x^6\cot^{-1}\left(ax^2\right)$$

```
[Out] x^4/(12*a) + (x^6*ArcCot[a*x^2])/6 - Log[1 + a^2*x^4]/(12*a^3)
```

Rubi [A] time = 0.0253619, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5034, 266, 43}

$$-\frac{\log\left(a^2x^4+1\right)}{12a^3}+\frac{x^4}{12a}+\frac{1}{6}x^6\cot^{-1}\left(ax^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^5*ArcCot[a*x^2],x]
```

```
[Out] x^4/(12*a) + (x^6*ArcCot[a*x^2])/6 - Log[1 + a^2*x^4]/(12*a^3)
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int x^5\cot^{-1}\left(ax^2\right)dx &= \frac{1}{6}x^6\cot^{-1}\left(ax^2\right)+\frac{1}{3}a\int\frac{x^7}{1+a^2x^4}\,dx\\ &= \frac{1}{6}x^6\cot^{-1}\left(ax^2\right)+\frac{1}{12}a\,\text{Subst}\left(\int\frac{x}{1+a^2x}\,dx,x,x^4\right)\\ &= \frac{1}{6}x^6\cot^{-1}\left(ax^2\right)+\frac{1}{12}a\,\text{Subst}\left(\int\left(\frac{1}{a^2}-\frac{1}{a^2\left(1+a^2x\right)}\right)dx,x,x^4\right)\\ &= \frac{x^4}{12a}+\frac{1}{6}x^6\cot^{-1}\left(ax^2\right)-\frac{\log\left(1+a^2x^4\right)}{12a^3}\end{aligned}$$

Mathematica [A] time = 0.0144449, size = 41, normalized size = 1.

$$-\frac{\log\left(a^2x^4+1\right)}{12a^3}+\frac{x^4}{12a}+\frac{1}{6}x^6\cot^{-1}\left(ax^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*ArcCot[a*x^2],x]
```

```
[Out] x^4/(12*a) + (x^6*ArcCot[a*x^2])/6 - Log[1 + a^2*x^4]/(12*a^3)
```

Maple [A] time = 0.045, size = 36, normalized size = 0.9

$$\frac{x^4}{12\,a}+\frac{x^6\text{arccot}\left(ax^2\right)}{6}-\frac{\ln\left(a^2x^4+1\right)}{12\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arccot(a*x^2),x)
```

```
[Out] 1/12*x^4/a+1/6*x^6*arccot(a*x^2)-1/12*ln(a^2*x^4+1)/a^3
```

Maxima [A] time = 0.974629, size = 51, normalized size = 1.24

$$\frac{1}{6}\,x^6\,\text{arccot}\left(ax^2\right)+\frac{1}{12}\left(\frac{x^4}{a^2}-\frac{\log\left(a^2x^4+1\right)}{a^4}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x^2),x, algorithm="maxima")
```

```
[Out] 1/6*x^6*arccot(a*x^2) + 1/12*(x^4/a^2 - log(a^2*x^4 + 1)/a^4)*a
```

Fricas [A] time = 2.1604, size = 88, normalized size = 2.15

$$\frac{2\,a^{3}x^{6}\,\operatorname{arccot}\left(ax^{2}\right)+a^{2}x^{4}-\log\left(a^{2}x^{4}+1\right)}{12\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x^2),x, algorithm="fricas")
```

```
[Out] 1/12*(2*a^3*x^6*arccot(a*x^2) + a^2*x^4 - log(a^2*x^4 + 1))/a^3
```

Sympy [A] time = 2.93952, size = 39, normalized size = 0.95

$$\begin{cases} \frac{x^{6}\operatorname{acot}\left(ax^{2}\right)}{6}+\frac{x^{4}}{12a}-\frac{\log\left(a^{2}x^{4}+1\right)}{12a^{3}} & \text{for } a\neq 0\\ \frac{\pi x^{6}}{12} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*acot(a*x**2),x)
```

```
[Out] Piecewise((x**6*acot(a*x**2)/6 + x**4/(12*a) - log(a**2*x**4 + 1)/(12*a**3)
, Ne(a, 0)), (pi*x**6/12, True))
```

Giac [A] time = 1.10586, size = 54, normalized size = 1.32

$$\frac{1}{6}\,x^{6}\arctan\left(\frac{1}{ax^{2}}\right)+\frac{1}{12}\left(\frac{x^{4}}{a^{2}}-\frac{\log\left(a^{2}x^{4}+1\right)}{a^{4}}\right)a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arccot(a*x^2),x, algorithm="giac")
```

```
[Out] 1/6*x^6*arctan(1/(a*x^2)) + 1/12*(x^4/a^2 - log(a^2*x^4 + 1)/a^4)*a
```

3.75 $\int x^3 \cot^{-1}\left(ax^2\right) dx$

Optimal. Leaf size=37

$$-\frac{\tan^{-1}\left(ax^2\right)}{4a^2}+\frac{x^2}{4a}+\frac{1}{4}x^4\cot^{-1}\left(ax^2\right)$$

```
[Out] x^2/(4*a) + (x^4*ArcCot[a*x^2])/4 - ArcTan[a*x^2]/(4*a^2)
```

Rubi [A] time = 0.0193072, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5034, 275, 321, 203}

$$-\frac{\tan^{-1}\left(ax^2\right)}{4a^2}+\frac{x^2}{4a}+\frac{1}{4}x^4\cot^{-1}\left(ax^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcCot[a*x^2],x]
```

```
[Out] x^2/(4*a) + (x^4*ArcCot[a*x^2])/4 - ArcTan[a*x^2]/(4*a^2)
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 275

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k = GCD[m
+ 1, n]}, Dist[1/k, Subst[Int[x^((m + 1)/k - 1)*(a + b*x^(n/k))^p, x], x, x
^k], x] /; k != 1] /; FreeQ[{a, b, p}, x] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int x^3 \cot^{-1}\left(ax^2\right) dx &= \frac{1}{4}x^4 \cot^{-1}\left(ax^2\right) + \frac{1}{2}a\int \frac{x^5}{1+a^2x^4}\,dx\\ &= \frac{1}{4}x^4 \cot^{-1}\left(ax^2\right) + \frac{1}{4}a\,\text{Subst}\left(\int \frac{x^2}{1+a^2x^2}\,dx, x, x^2\right)\\ &= \frac{x^2}{4a} + \frac{1}{4}x^4 \cot^{-1}\left(ax^2\right) - \frac{\text{Subst}\left(\int \frac{1}{1+a^2x^2}\,dx, x, x^2\right)}{4a}\\ &= \frac{x^2}{4a} + \frac{1}{4}x^4 \cot^{-1}\left(ax^2\right) - \frac{\tan^{-1}\left(ax^2\right)}{4a^2}\end{aligned}$$

Mathematica [A] time = 0.0056528, size = 37, normalized size = 1.

$$-\frac{\tan^{-1}\left(ax^2\right)}{4a^2} + \frac{x^2}{4a} + \frac{1}{4}x^4 \cot^{-1}\left(ax^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*ArcCot[a*x^2],x]
```

```
[Out] x^2/(4*a) + (x^4*ArcCot[a*x^2])/4 - ArcTan[a*x^2]/(4*a^2)
```

Maple [A] time = 0.04, size = 32, normalized size = 0.9

$$\frac{x^2}{4\,a} + \frac{x^4 \text{arccot}\left(ax^2\right)}{4} - \frac{\arctan\left(ax^2\right)}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(a*x^2),x)
```

```
[Out] 1/4*x^2/a+1/4*x^4*arccot(a*x^2)-1/4*arctan(a*x^2)/a^2
```

Maxima [A] time = 1.44328, size = 46, normalized size = 1.24

$$\frac{1}{4}x^4\operatorname{arccot}\left(ax^2\right)+\frac{1}{4}a\left(\frac{x^2}{a^2}-\frac{\arctan\left(ax^2\right)}{a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x^2),x, algorithm="maxima")
```

```
[Out] 1/4*x^4*arccot(a*x^2) + 1/4*a*(x^2/a^2 - arctan(a*x^2)/a^3)
```

Fricas [A] time = 2.10793, size = 63, normalized size = 1.7

$$\frac{ax^2+\left(a^2x^4+1\right)\operatorname{arccot}\left(ax^2\right)}{4\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x^2),x, algorithm="fricas")
```

```
[Out] 1/4*(a*x^2 + (a^2*x^4 + 1)*arccot(a*x^2))/a^2
```

Sympy [A] time = 1.48478, size = 36, normalized size = 0.97

$$\begin{cases}\frac{x^4\operatorname{acot}\left(ax^2\right)}{4}+\frac{x^2}{4a}+\frac{\operatorname{acot}\left(ax^2\right)}{4a^2} & \text{for } a\neq 0\\ \frac{\pi x^4}{8} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(a*x**2),x)
```

```
[Out] Piecewise((x**4*acot(a*x**2)/4 + x**2/(4*a) + acot(a*x**2)/(4*a**2), Ne(a,
0)), (pi*x**4/8, True))
```

Giac [A] time = 1.12607, size = 49, normalized size = 1.32

$$\frac{1}{4}\,x^4\arctan\left(\frac{1}{ax^2}\right)+\frac{1}{4}\,a\left(\frac{x^2}{a^2}-\frac{\arctan\left(ax^2\right)}{a^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(a*x^2),x, algorithm="giac")
```

```
[Out] 1/4*x^4*arctan(1/(a*x^2)) + 1/4*a*(x^2/a^2 - arctan(a*x^2)/a^3)
```

3.76 $\int x \cot^{-1}\left(ax^2\right) dx$

Optimal. Leaf size=31

$$\frac{\log\left(a^2x^4+1\right)}{4a}+\frac{1}{2}x^2\cot^{-1}\left(ax^2\right)$$

```
[Out] (x^2*ArcCot[a*x^2])/2 + Log[1 + a^2*x^4]/(4*a)
```

Rubi [A] time = 0.0091751, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {5034, 260}

$$\frac{\log\left(a^2x^4+1\right)}{4a}+\frac{1}{2}x^2\cot^{-1}\left(ax^2\right)$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[a*x^2],x]
```

```
[Out] (x^2*ArcCot[a*x^2])/2 + Log[1 + a^2*x^4]/(4*a)
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int x\cot^{-1}\left(ax^2\right)dx&=\frac{1}{2}x^2\cot^{-1}\left(ax^2\right)+a\int\frac{x^3}{1+a^2x^4}\,dx\\&=\frac{1}{2}x^2\cot^{-1}\left(ax^2\right)+\frac{\log\left(1+a^2x^4\right)}{4a}\end{aligned}$$

Mathematica [A] time = 0.006245, size = 31, normalized size = 1.

$$\frac{\log\left(a^2x^4+1\right)}{4a}+\frac{1}{2}x^2\cot^{-1}\left(ax^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[a*x^2],x]
```

```
[Out] (x^2*ArcCot[a*x^2])/2 + Log[1 + a^2*x^4]/(4*a)
```

Maple [A] time = 0.039, size = 28, normalized size = 0.9

$$\frac{x^2\text{arccot}\left(ax^2\right)}{2}+\frac{\ln\left(a^2x^4+1\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(a*x^2),x)
```

```
[Out] 1/2*x^2*arccot(a*x^2)+1/4*ln(a^2*x^4+1)/a
```

Maxima [A] time = 0.993607, size = 38, normalized size = 1.23

$$\frac{2\,ax^2\,\text{arccot}\left(ax^2\right)+\log\left(a^2x^4+1\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x^2),x, algorithm="maxima")
```

```
[Out] 1/4*(2*a*x^2*arccot(a*x^2) + log(a^2*x^4 + 1))/a
```

Fricas [A] time = 2.21044, size = 68, normalized size = 2.19

$$\frac{2\,ax^2\,\text{arccot}\left(ax^2\right)+\log\left(a^2x^4+1\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x^2),x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*x^2*arccot(a*x^2) + log(a^2*x^4 + 1))/a
```

Sympy [A] time = 0.839381, size = 31, normalized size = 1.

$$\begin{cases} \frac{x^2 \operatorname{acot}\left(ax^2\right)}{2} + \frac{\log\left(a^2x^4+1\right)}{4a} & \text{for } a \neq 0 \\ \frac{\pi x^2}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(a*x**2),x)
```

```
[Out] Piecewise((x**2*acot(a*x**2)/2 + log(a**2*x**4 + 1)/(4*a), Ne(a, 0)), (pi*x
**2/4, True))
```

Giac [A] time = 1.09056, size = 39, normalized size = 1.26

$$\frac{1}{2}\,x^2\arctan\left(\frac{1}{ax^2}\right) + \frac{\log\left(a^2x^4+1\right)}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a*x^2),x, algorithm="giac")
```

```
[Out] 1/2*x^2*arctan(1/(a*x^2)) + 1/4*log(a^2*x^4 + 1)/a
```

3.77 $\int \frac{\cot^{-1}(ax^2)}{x} dx$

Optimal. Leaf size=37

$$\frac{1}{4}i\text{PolyLog}\left(2,\frac{i}{ax^2}\right)-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{i}{ax^2}\right)$$

```
[Out] (-I/4)*PolyLog[2, (-I)/(a*x^2)] + (I/4)*PolyLog[2, I/(a*x^2)]
```

Rubi [A] time = 0.0338291, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5032, 4849, 2391}

$$\frac{1}{4}i\text{PolyLog}\left(2,\frac{i}{ax^2}\right)-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{i}{ax^2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^2]/x,x]
```

```
[Out] (-I/4)*PolyLog[2, (-I)/(a*x^2)] + (I/4)*PolyLog[2, I/(a*x^2)]
```

Rule 5032

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1
/n, Subst[Int[(a + b*ArcCot[c*x])^p/x, x], x, x^n], x] /; FreeQ[{a, b, c, n
}, x] && IGtQ[p, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}\left(ax^2\right)}{x}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{\cot^{-1}(ax)}{x}\,dx, x, x^2\right)$$
$$= \frac{1}{4}i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{ax}\right)}{x}\,dx, x, x^2\right) - \frac{1}{4}i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{ax}\right)}{x}\,dx, x, x^2\right)$$
$$= -\frac{1}{4}i\text{Li}_2\left(-\frac{i}{ax^2}\right) + \frac{1}{4}i\text{Li}_2\left(\frac{i}{ax^2}\right)$$

Mathematica [A] time = 0.0056303, size = 37, normalized size = 1.

$$\frac{1}{4}i\text{PolyLog}\left(2,\frac{i}{ax^2}\right) - \frac{1}{4}i\text{PolyLog}\left(2,-\frac{i}{ax^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^2]/x,x]
```

```
[Out] (-I/4)*PolyLog[2, (-I)/(a*x^2)] + (I/4)*PolyLog[2, I/(a*x^2)]
```

Maple [C] time = 0.117, size = 57, normalized size = 1.5

$$\ln(x)\,\text{arccot}\left(ax^2\right) + \frac{1}{2a}\sum_{\_R1=\text{RootOf}\left(a^2\_Z^4+1\right)}\frac{1}{\_R1^2}\left(\ln(x)\ln\left(\frac{\_R1-x}{\_R1}\right) + \text{dilog}\left(\frac{\_R1-x}{\_R1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^2)/x,x)
```

```
[Out] ln(x)*arccot(a*x^2)+1/2/a*sum(1/_R1^2*(ln(x)*ln((_R1-x)/_R1)+dilog((_R1-x)/
_R1)),_R1=RootOf(_Z^4*a^2+1))
```

Maxima [B] time = 1.61403, size = 108, normalized size = 2.92

$$-\frac{1}{2}i\,\arctan\left(ax^2\right)\arctan(0,a) + \frac{1}{8}\pi\log\left(a^2x^4+1\right) - \frac{1}{2}\,\arctan\left(ax^2\right)\log\left(x^2|a|\right) + \text{arccot}\left(ax^2\right)\log(x) + \arctan\left(ax^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x,x, algorithm="maxima")
```

```
[Out] -1/2*I*arctan(a*x^2)*arctan2(0, a) + 1/8*pi*log(a^2*x^4 + 1) - 1/2*arctan(a
*x^2)*log(x^2*abs(a)) + arccot(a*x^2)*log(x) + arctan(a*x^2)*log(x) + 1/4*I
*dilog(I*a*x^2 + 1) - 1/4*I*dilog(-I*a*x^2 + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}\left(ax^2\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x^2)/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}\left(ax^2\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**2)/x,x)
```

```
[Out] Integral(acot(a*x**2)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(ax^2\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x^2)/x, x)
```

3.78 $\int \frac{\cot^{-1}(ax^2)}{x^3}\,dx$

Optimal. Leaf size=34

$$\frac{1}{4}a\log\left(a^2x^4+1\right)-\frac{\cot^{-1}\left(ax^2\right)}{2x^2}-a\log(x)$$

```
[Out] -ArcCot[a*x^2]/(2*x^2) - a*Log[x] + (a*Log[1 + a^2*x^4])/4
```

Rubi [A] time = 0.0173108, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {5034, 266, 36, 29, 31}

$$\frac{1}{4}a\log\left(a^2x^4+1\right)-\frac{\cot^{-1}\left(ax^2\right)}{2x^2}-a\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^2]/x^3,x]
```

```
[Out] -ArcCot[a*x^2]/(2*x^2) - a*Log[x] + (a*Log[1 + a^2*x^4])/4
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}\left(ax^2\right)}{x^3}\,dx &= -\frac{\cot^{-1}\left(ax^2\right)}{2x^2} - a\int \frac{1}{x\left(1+a^2x^4\right)}\,dx \\
&= -\frac{\cot^{-1}\left(ax^2\right)}{2x^2} - \frac{1}{4}a\,\text{Subst}\left(\int \frac{1}{x\left(1+a^2x\right)}\,dx, x, x^4\right) \\
&= -\frac{\cot^{-1}\left(ax^2\right)}{2x^2} - \frac{1}{4}a\,\text{Subst}\left(\int \frac{1}{x}\,dx, x, x^4\right) + \frac{1}{4}a^3\,\text{Subst}\left(\int \frac{1}{1+a^2x}\,dx, x, x^4\right) \\
&= -\frac{\cot^{-1}\left(ax^2\right)}{2x^2} - a\log(x) + \frac{1}{4}a\log\left(1+a^2x^4\right)
\end{aligned}
$$

Mathematica [A] time = 0.0058354, size = 34, normalized size = 1.

$$\frac{1}{4}a\log\left(a^2x^4+1\right) - \frac{\cot^{-1}\left(ax^2\right)}{2x^2} - a\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^2]/x^3,x]
```

```
[Out] -ArcCot[a*x^2]/(2*x^2) - a*Log[x] + (a*Log[1 + a^2*x^4])/4
```

Maple [A] time = 0.048, size = 31, normalized size = 0.9

$$-\frac{\operatorname{arccot}\left(ax^2\right)}{2\,x^2} - a\ln\left(x\right) + \frac{a\ln\left(a^2x^4+1\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^2)/x^3,x)
```

```
[Out] -1/2*arccot(a*x^2)/x^2-a*ln(x)+1/4*a*ln(a^2*x^4+1)
```

Maxima [A] time = 0.965668, size = 43, normalized size = 1.26

$$\frac{1}{4}\,a\left(\log\left(a^2x^4+1\right)-\log\left(x^4\right)\right)-\frac{\operatorname{arccot}\left(ax^2\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*(log(a^2*x^4 + 1) - log(x^4)) - 1/2*arccot(a*x^2)/x^2
```

Fricas [A] time = 2.29115, size = 93, normalized size = 2.74

$$\frac{ax^2\log\left(a^2x^4+1\right)-4\,ax^2\log\left(x\right)-2\,\operatorname{arccot}\left(ax^2\right)}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(a*x^2*log(a^2*x^4 + 1) - 4*a*x^2*log(x) - 2*arccot(a*x^2))/x^2
```

Sympy [A] time = 1.05433, size = 29, normalized size = 0.85

$$-a\log\left(x\right)+\frac{a\log\left(a^2x^4+1\right)}{4}-\frac{\operatorname{acot}\left(ax^2\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**2)/x**3,x)
```

```
[Out] -a*log(x) + a*log(a**2*x**4 + 1)/4 - acot(a*x**2)/(2*x**2)
```

Giac [A] time = 1.14325, size = 46, normalized size = 1.35

$$\frac{1}{4}\,a\left(\log\left(a^2x^4+1\right)-\log\left(x^4\right)\right)-\frac{\arctan\left(\frac{1}{ax^2}\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^3,x, algorithm="giac")
```

```
[Out] 1/4*a*(log(a^2*x^4 + 1) - log(x^4)) - 1/2*arctan(1/(a*x^2))/x^2
```

3.79 $\int \frac{\cot^{-1}(ax^2)}{x^5}\,dx$

Optimal. Leaf size=35

$$\frac{1}{4}a^2\tan^{-1}\left(ax^2\right)+\frac{a}{4x^2}-\frac{\cot^{-1}\left(ax^2\right)}{4x^4}$$

```
[Out] a/(4*x^2) - ArcCot[a*x^2]/(4*x^4) + (a^2*ArcTan[a*x^2])/4
```

Rubi [A] time = 0.0179996, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5034, 275, 325, 203}

$$\frac{1}{4}a^2\tan^{-1}\left(ax^2\right)+\frac{a}{4x^2}-\frac{\cot^{-1}\left(ax^2\right)}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^2]/x^5,x]
```

```
[Out] a/(4*x^2) - ArcCot[a*x^2]/(4*x^4) + (a^2*ArcTan[a*x^2])/4
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 275

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> With[{k = GCD[m
+ 1, n]}, Dist[1/k, Subst[Int[x^((m + 1)/k - 1)*(a + b*x^(n/k))^p, x], x, x
^k], x] /; k != 1] /; FreeQ[{a, b, p}, x] && IGtQ[n, 0] && IntegerQ[m]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
```

```
x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}(ax^2)}{x^5}\,dx &= -\frac{\cot^{-1}(ax^2)}{4x^4} - \frac{1}{2}a\int \frac{1}{x^3(1+a^2x^4)}\,dx \\
&= -\frac{\cot^{-1}(ax^2)}{4x^4} - \frac{1}{4}a\,\text{Subst}\left(\int \frac{1}{x^2(1+a^2x^2)}\,dx, x, x^2\right) \\
&= \frac{a}{4x^2} - \frac{\cot^{-1}(ax^2)}{4x^4} + \frac{1}{4}a^3\,\text{Subst}\left(\int \frac{1}{1+a^2x^2}\,dx, x, x^2\right) \\
&= \frac{a}{4x^2} - \frac{\cot^{-1}(ax^2)}{4x^4} + \frac{1}{4}a^2\tan^{-1}(ax^2)
\end{aligned}
$$

Mathematica [C] time = 0.0064748, size = 38, normalized size = 1.09

$$
\frac{a\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-a^2x^4\right)}{4x^2} - \frac{\cot^{-1}(ax^2)}{4x^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^2]/x^5,x]
```

```
[Out] -ArcCot[a*x^2]/(4*x^4) + (a*Hypergeometric2F1[-1/2, 1, 1/2, -(a^2*x^4)])/(4
*x^2)
```

Maple [A] time = 0.044, size = 30, normalized size = 0.9

$$
\frac{a}{4\,x^2} - \frac{\text{arccot}(ax^2)}{4\,x^4} + \frac{a^2\arctan(ax^2)}{4}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^2)/x^5,x)
```

```
[Out] 1/4*a/x^2-1/4*arccot(a*x^2)/x^4+1/4*a^2*arctan(a*x^2)
```

Maxima [A] time = 1.46295, size = 36, normalized size = 1.03

$$\frac{1}{4}\left(a\arctan\left(ax^2\right)+\frac{1}{x^2}\right)a-\frac{\operatorname{arccot}\left(ax^2\right)}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^5,x, algorithm="maxima")
```

```
[Out] 1/4*(a*arctan(a*x^2) + 1/x^2)*a - 1/4*arccot(a*x^2)/x^4
```

Fricas [A] time = 2.12745, size = 63, normalized size = 1.8

$$\frac{ax^2-\left(a^2x^4+1\right)\operatorname{arccot}\left(ax^2\right)}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^5,x, algorithm="fricas")
```

```
[Out] 1/4*(a*x^2 - (a^2*x^4 + 1)*arccot(a*x^2))/x^4
```

Sympy [A] time = 1.73273, size = 29, normalized size = 0.83

$$-\frac{a^2\operatorname{acot}\left(ax^2\right)}{4}+\frac{a}{4x^2}-\frac{\operatorname{acot}\left(ax^2\right)}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**2)/x**5,x)
```

```
[Out] -a**2*acot(a*x**2)/4 + a/(4*x**2) - acot(a*x**2)/(4*x**4)
```

Giac [A] time = 1.12162, size = 39, normalized size = 1.11

$$\frac{1}{4}\left(a\arctan\left(ax^2\right)+\frac{1}{x^2}\right)a-\frac{\arctan\left(\frac{1}{ax^2}\right)}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^5,x, algorithm="giac")
```

```
[Out] 1/4*(a*arctan(a*x^2) + 1/x^2)*a - 1/4*arctan(1/(a*x^2))/x^4
```

3.80 $\int x^4 \cot^{-1}\left(ax^2\right) dx$

Optimal. Leaf size=152

$$-\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{10\sqrt{2}a^{5/2}}+\frac{\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{10\sqrt{2}a^{5/2}}+\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{5\sqrt{2}a^{5/2}}-\frac{\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{5\sqrt{2}a^{5/2}}+\frac{2x^3}{15a}+\frac{1}{5}x^5\cot^{-1}\left(ax\right.$$

```
[Out] (2*x^3)/(15*a) + (x^5*ArcCot[a*x^2])/5 + ArcTan[1 - Sqrt[2]*Sqrt[a]*x]/(5*S
qrt[2]*a^(5/2)) - ArcTan[1 + Sqrt[2]*Sqrt[a]*x]/(5*Sqrt[2]*a^(5/2)) - Log[1
 - Sqrt[2]*Sqrt[a]*x + a*x^2]/(10*Sqrt[2]*a^(5/2)) + Log[1 + Sqrt[2]*Sqrt[a
]*x + a*x^2]/(10*Sqrt[2]*a^(5/2))
```

Rubi [A] time = 0.104254, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8, Rules used = {5034, 321, 297, 1162, 617, 204, 1165, 628}

$$-\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{10\sqrt{2}a^{5/2}}+\frac{\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{10\sqrt{2}a^{5/2}}+\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{5\sqrt{2}a^{5/2}}-\frac{\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{5\sqrt{2}a^{5/2}}+\frac{2x^3}{15a}+\frac{1}{5}x^5\cot^{-1}\left(ax\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^4*ArcCot[a*x^2],x]
```

```
[Out] (2*x^3)/(15*a) + (x^5*ArcCot[a*x^2])/5 + ArcTan[1 - Sqrt[2]*Sqrt[a]*x]/(5*S
qrt[2]*a^(5/2)) - ArcTan[1 + Sqrt[2]*Sqrt[a]*x]/(5*Sqrt[2]*a^(5/2)) - Log[1
 - Sqrt[2]*Sqrt[a]*x + a*x^2]/(10*Sqrt[2]*a^(5/2)) + Log[1 + Sqrt[2]*Sqrt[a
]*x + a*x^2]/(10*Sqrt[2]*a^(5/2))
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rubi steps

$$\int x^4 \cot^{-1}(ax^2)\,dx = \frac{1}{5}x^5\cot^{-1}(ax^2) + \frac{1}{5}(2a)\int \frac{x^6}{1+a^2x^4}\,dx$$
$$= \frac{2x^3}{15a} + \frac{1}{5}x^5\cot^{-1}(ax^2) - \frac{2\int \frac{x^2}{1+a^2x^4}\,dx}{5a}$$
$$= \frac{2x^3}{15a} + \frac{1}{5}x^5\cot^{-1}(ax^2) + \frac{\int \frac{1-ax^2}{1+a^2x^4}\,dx}{5a^2} - \frac{\int \frac{1+ax^2}{1+a^2x^4}\,dx}{5a^2}$$
$$= \frac{2x^3}{15a} + \frac{1}{5}x^5\cot^{-1}(ax^2) - \frac{\int \frac{1}{\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx}{10a^3} - \frac{\int \frac{1}{\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx}{10a^3} - \frac{\int \frac{\frac{\sqrt{2}}{\sqrt{a}}+2x}{-\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}-x^2}\,dx}{10\sqrt{2}a^{5/2}} - \frac{\int \frac{\frac{\sqrt{2}}{\sqrt{a}}-2x}{-\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}-x^2}\,dx}{10\sqrt{2}a^{5/2}}$$
$$= \frac{2x^3}{15a} + \frac{1}{5}x^5\cot^{-1}(ax^2) - \frac{\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{10\sqrt{2}a^{5/2}} + \frac{\log\left(1+\sqrt{2}\sqrt{a}x+ax^2\right)}{10\sqrt{2}a^{5/2}} - \frac{\text{Subst}\left(\int \frac{1}{-1-x^2}\,dx,\right.}{5\sqrt{2}a^{5}}$$
$$= \frac{2x^3}{15a} + \frac{1}{5}x^5\cot^{-1}(ax^2) + \frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{5\sqrt{2}a^{5/2}} - \frac{\tan^{-1}\left(1+\sqrt{2}\sqrt{a}x\right)}{5\sqrt{2}a^{5/2}} - \frac{\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{10\sqrt{2}a^{5/2}} +$$

Mathematica [A] time = 0.0414145, size = 136, normalized size = 0.89

$$\frac{8a^{3/2}x^3 + 12a^{5/2}x^5\cot^{-1}(ax^2) - 3\sqrt{2}\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right) + 3\sqrt{2}\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right) + 6\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right) -}{60a^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*ArcCot[a*x^2],x]
```

```
[Out] (8*a^(3/2)*x^3 + 12*a^(5/2)*x^5*ArcCot[a*x^2] + 6*Sqrt[2]*ArcTan[1 - Sqrt[2
]*Sqrt[a]*x] - 6*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[a]*x] - 3*Sqrt[2]*Log[1 -
Sqrt[2]*Sqrt[a]*x + a*x^2] + 3*Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[a]*x + a*x^2])/
(60*a^(5/2))
```

Maple [A] time = 0.061, size = 129, normalized size = 0.9

$$\frac{x^5\text{arccot}\left(ax^2\right)}{5} + \frac{2\,x^3}{15\,a} - \frac{\sqrt{2}}{20\,a^3}\ln\left(\left(x^2-\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)\left(x^2+\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)^{-1}\right)\frac{1}{\sqrt[4]{a^{-2}}} - \frac{\sqrt{2}}{10\,a^3}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{a^{-}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arccot(a*x^2),x)
```

```
[Out] 1/5*x^5*arccot(a*x^2)+2/15*x^3/a-1/20/a^3/(1/a^2)^(1/4)*2^(1/2)*ln((x^2-(1/
a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1/2))/(x^2+(1/a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1
/2)))-1/10/a^3/(1/a^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x+1)-1/10
/a^3/(1/a^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x-1)
```

Maxima [B] time = 1.45523, size = 362, normalized size = 2.38

$$\frac{1}{5}\,x^5\,\operatorname{arccot}\left(ax^2\right)+\frac{1}{60}\,a\left(\frac{8\,x^3}{a^2}+\frac{3\left(\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2-\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\frac{2\sqrt{a^2}x-\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}{2\sqrt{a^2}x+\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}\right)}{\sqrt{a^2}\sqrt{-\sqrt{a^2}}}-\cdots\right)}{a^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x^2),x, algorithm="maxima")
```

```
[Out] 1/5*x^5*arccot(a*x^2) + 1/60*a*(8*x^3/a^2 + 3*(sqrt(2)*log(sqrt(a^2)*x^2 +
sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(3/4) - sqrt(2)*log(sqrt(a^2)*x^2 - sqrt(2
)*(a^2)^(1/4)*x + 1)/(a^2)^(3/4) - sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqr
t(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4))/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^
2)) + sqrt(2)*(a^2)^(1/4)))/(sqrt(a^2)*sqrt(-sqrt(a^2))) - sqrt(2)*log((2*s
qrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2)) - sqrt(2)*(a^2)^(1/4))/(2*sqrt(a^2)*x
 + sqrt(2)*sqrt(-sqrt(a^2)) - sqrt(2)*(a^2)^(1/4)))/(sqrt(a^2)*sqrt(-sqrt(a
^2))))/a^2)
```

Fricas [B] time = 2.36893, size = 757, normalized size = 4.98

$$\frac{12\,ax^5\arctan\left(\frac{1}{ax^2}\right)+8\,x^3+12\,\sqrt{2}a\frac{1}{a^{10}}^{\frac{1}{4}}\arctan\left(-\sqrt{2}a^3\frac{1}{a^{10}}^{\frac{1}{4}}x+\sqrt{2}\sqrt{\sqrt{2}a^7\frac{1}{a^{10}}^{\frac{3}{4}}x+a^4\sqrt{\frac{1}{a^{10}}}+x^2}a^3\frac{1}{a^{10}}^{\frac{1}{4}}-1\right)+12\,\sqrt{2}a\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x^2),x, algorithm="fricas")
```

```
[Out] 1/60*(12*a*x^5*arctan(1/(a*x^2)) + 8*x^3 + 12*sqrt(2)*a*(a^(-10))^(1/4)*arc
tan(-sqrt(2)*a^3*(a^(-10))^(1/4)*x + sqrt(2)*sqrt(sqrt(2)*a^7*(a^(-10))^(3/
4)*x + a^4*sqrt(a^(-10)) + x^2)*a^3*(a^(-10))^(1/4) - 1) + 12*sqrt(2)*a*(a^
(-10))^(1/4)*arctan(-sqrt(2)*a^3*(a^(-10))^(1/4)*x + sqrt(2)*sqrt(-sqrt(2)*
a^7*(a^(-10))^(3/4)*x + a^4*sqrt(a^(-10)) + x^2)*a^3*(a^(-10))^(1/4) + 1) +
 3*sqrt(2)*a*(a^(-10))^(1/4)*log(sqrt(2)*a^7*(a^(-10))^(3/4)*x + a^4*sqrt(a
^(-10)) + x^2) - 3*sqrt(2)*a*(a^(-10))^(1/4)*log(-sqrt(2)*a^7*(a^(-10))^(3/
4)*x + a^4*sqrt(a^(-10)) + x^2))/a
```

Sympy [A] time = 58.1177, size = 1086, normalized size = 7.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*acot(a*x**2),x)
```

```
[Out] Piecewise((-x**5*acot((-sqrt(2)/2 - sqrt(2)*I/2)**(-2))/5, Eq(a, -1/(x**2*(
-sqrt(2)/2 - sqrt(2)*I/2)**2))), (-x**5*acot((-sqrt(2)/2 + sqrt(2)*I/2)**(-
2))/5, Eq(a, -1/(x**2*(-sqrt(2)/2 + sqrt(2)*I/2)**2))), (-x**5*acot((sqrt(2
)/2 - sqrt(2)*I/2)**(-2))/5, Eq(a, -1/(x**2*(sqrt(2)/2 - sqrt(2)*I/2)**2)))
, (-x**5*acot((sqrt(2)/2 + sqrt(2)*I/2)**(-2))/5, Eq(a, -1/(x**2*(sqrt(2)/2
 + sqrt(2)*I/2)**2))), (pi*x**5/10, Eq(a, 0)), (-6*(-1)**(3/4)*a**10*x**9*(
a**(-2))**(15/4)*acot(a*x**2)/(-30*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4)
 - 30*(-1)**(3/4)*a**8*(a**(-2))**(15/4)) - 4*(-1)**(3/4)*a**9*x**7*(a**(-2
))**(15/4)/(-30*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a
**8*(a**(-2))**(15/4)) - 6*(-1)**(3/4)*a**8*x**5*(a**(-2))**(15/4)*acot(a*x
**2)/(-30*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a
**(-2))**(15/4)) - 4*(-1)**(3/4)*a**7*x**3*(a**(-2))**(15/4)/(-30*(-1)**(3/
4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(-2))**(15/4)) +
6*I*a**5*x**4*(a**(-2))**(5/2)*log(x - (-1)**(1/4)*(a**(-2))**(1/4))/(-30*(
-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(-2))**(1
5/4)) - 3*I*a**5*x**4*(a**(-2))**(5/2)*log(x**2 + I*sqrt(a**(-2)))/(-30*(-1
)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(-2))**(15/
4)) - 6*I*a**5*x**4*(a**(-2))**(5/2)*atan((-1)**(3/4)*x/(a**(-2))**(1/4))/(
-30*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(-2)
)**(15/4)) + 6*I*a**3*(a**(-2))**(5/2)*log(x - (-1)**(1/4)*(a**(-2))**(1/4)
)/(-30*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(
-2))**(15/4)) - 3*I*a**3*(a**(-2))**(5/2)*log(x**2 + I*sqrt(a**(-2)))/(-30*
(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(-2))**(
```

```
15/4)) - 6*I*a**3*(a**(-2))**(5/2)*atan((-1)**(3/4)*x/(a**(-2))**(1/4))/(-3
0*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**8*(a**(-2))*
*(15/4)) - 6*x**4*acot(a*x**2)/(-30*(-1)**(3/4)*a**10*x**4*(a**(-2))**(15/4
) - 30*(-1)**(3/4)*a**8*(a**(-2))**(15/4)) - 6*acot(a*x**2)/(-30*(-1)**(3/4
)*a**12*x**4*(a**(-2))**(15/4) - 30*(-1)**(3/4)*a**10*(a**(-2))**(15/4)), T
rue))
```

Giac [A] time = 1.1401, size = 211, normalized size = 1.39

$$\frac{1}{5}x^5\arctan\left(\frac{1}{ax^2}\right)+\frac{1}{60}a\left(\frac{8x^3}{a^2}-\frac{6\sqrt{2}\sqrt{|a|}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{a^4}-\frac{6\sqrt{2}\sqrt{|a|}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{a^4}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arccot(a*x^2),x, algorithm="giac")
```

```
[Out] 1/5*x^5*arctan(1/(a*x^2)) + 1/60*a*(8*x^3/a^2 - 6*sqrt(2)*sqrt(abs(a))*arct
an(1/2*sqrt(2)*(2*x + sqrt(2)/sqrt(abs(a)))*sqrt(abs(a)))/a^4 - 6*sqrt(2)*s
qrt(abs(a))*arctan(1/2*sqrt(2)*(2*x - sqrt(2)/sqrt(abs(a)))*sqrt(abs(a)))/a
^4 + 3*sqrt(2)*sqrt(abs(a))*log(x^2 + sqrt(2)*x/sqrt(abs(a)) + 1/abs(a))/a^
4 - 3*sqrt(2)*sqrt(abs(a))*log(x^2 - sqrt(2)*x/sqrt(abs(a)) + 1/abs(a))/a^4
)
```

3.81 $\int x^2 \cot^{-1}\left(ax^2\right) dx$

Optimal. Leaf size=150

$$\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}a^{3/2}}-\frac{\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}a^{3/2}}+\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}a^{3/2}}-\frac{\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{3\sqrt{2}a^{3/2}}+\frac{1}{3}x^3\cot^{-1}\left(ax^2\right)+\frac{2x}{3a}$$

```
[Out] (2*x)/(3*a) + (x^3*ArcCot[a*x^2])/3 + ArcTan[1 - Sqrt[2]*Sqrt[a]*x]/(3*Sqrt
[2]*a^(3/2)) - ArcTan[1 + Sqrt[2]*Sqrt[a]*x]/(3*Sqrt[2]*a^(3/2)) + Log[1 -
Sqrt[2]*Sqrt[a]*x + a*x^2]/(6*Sqrt[2]*a^(3/2)) - Log[1 + Sqrt[2]*Sqrt[a]*x
+ a*x^2]/(6*Sqrt[2]*a^(3/2))
```

Rubi [A] time = 0.0942241, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8, Rules used = {5034, 321, 211, 1165, 628, 1162, 617, 204}

$$\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}a^{3/2}}-\frac{\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}a^{3/2}}+\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}a^{3/2}}-\frac{\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{3\sqrt{2}a^{3/2}}+\frac{1}{3}x^3\cot^{-1}\left(ax^2\right)+\frac{2x}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[a*x^2],x]
```

```
[Out] (2*x)/(3*a) + (x^3*ArcCot[a*x^2])/3 + ArcTan[1 - Sqrt[2]*Sqrt[a]*x]/(3*Sqrt
[2]*a^(3/2)) - ArcTan[1 + Sqrt[2]*Sqrt[a]*x]/(3*Sqrt[2]*a^(3/2)) + Log[1 -
Sqrt[2]*Sqrt[a]*x + a*x^2]/(6*Sqrt[2]*a^(3/2)) - Log[1 + Sqrt[2]*Sqrt[a]*x
+ a*x^2]/(6*Sqrt[2]*a^(3/2))
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[a/b, 2]
], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*r), Int[(r - s*x^2)/(a + b*x^4),
 x], x] + Dist[1/(2*r), Int[(r + s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a, b
}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &&
AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int x^2\cot^{-1}(ax^2)\,dx = \frac{1}{3}x^3\cot^{-1}(ax^2) + \frac{1}{3}(2a)\int \frac{x^4}{1+a^2x^4}\,dx$$
$$= \frac{2x}{3a} + \frac{1}{3}x^3\cot^{-1}(ax^2) - \frac{2\int \frac{1}{1+a^2x^4}\,dx}{3a}$$
$$= \frac{2x}{3a} + \frac{1}{3}x^3\cot^{-1}(ax^2) - \frac{\int \frac{1-ax^2}{1+a^2x^4}\,dx}{3a} - \frac{\int \frac{1+ax^2}{1+a^2x^4}\,dx}{3a}$$
$$= \frac{2x}{3a} + \frac{1}{3}x^3\cot^{-1}(ax^2) - \frac{\int \frac{1}{\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx}{6a^2} - \frac{\int \frac{1}{\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx}{6a^2} + \frac{\int \frac{\frac{\sqrt{2}}{\sqrt{a}}+2x}{-\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}-x^2}\,dx}{6\sqrt{2}a^{3/2}} + \frac{\int \frac{\frac{\sqrt{2}}{\sqrt{a}}-2x}{-\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}-x^2}\,dx}{6\sqrt{2}a^{3/2}}$$
$$= \frac{2x}{3a} + \frac{1}{3}x^3\cot^{-1}(ax^2) + \frac{\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{6\sqrt{2}a^{3/2}} - \frac{\log\left(1+\sqrt{2}\sqrt{a}x+ax^2\right)}{6\sqrt{2}a^{3/2}} - \frac{\text{Subst}\left(\int \frac{1}{-1-x^2}\,dx, x\right.}{3\sqrt{2}a^{3/}}$$
$$= \frac{2x}{3a} + \frac{1}{3}x^3\cot^{-1}(ax^2) + \frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}a^{3/2}} - \frac{\tan^{-1}\left(1+\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}a^{3/2}} + \frac{\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{6\sqrt{2}a^{3/2}} - \frac{l}{\ }$$

Mathematica [A] time = 0.0273759, size = 133, normalized size = 0.89

$$\frac{4a^{3/2}x^3\cot^{-1}(ax^2) + \sqrt{2}\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right) - \sqrt{2}\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right) + 8\sqrt{a}x + 2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right) - 2\sqrt{2}}{12a^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[a*x^2],x]
```

```
[Out] (8*Sqrt[a]*x + 4*a^(3/2)*x^3*ArcCot[a*x^2] + 2*Sqrt[2]*ArcTan[1 - Sqrt[2]*S
qrt[a]*x] - 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[a]*x] + Sqrt[2]*Log[1 - Sqrt[
2]*Sqrt[a]*x + a*x^2] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[a]*x + a*x^2])/(12*a^(
3/2))
```

Maple [A] time = 0.043, size = 127, normalized size = 0.9

$$\frac{x^3\mathrm{arccot}(ax^2)}{3} + \frac{2x}{3a} - \frac{\sqrt{2}}{12a}\sqrt[4]{a^{-2}}\ln\left(\left(x^2+\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)\left(x^2-\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)^{-1}\right) - \frac{\sqrt{2}}{6a}\sqrt[4]{a^{-2}}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{a^{-}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(a*x^2),x)
```

```
[Out] 1/3*x^3*arccot(a*x^2)+2/3*x/a-1/12/a*(1/a^2)^(1/4)*2^(1/2)*ln((x^2+(1/a^2)^
(1/4)*x*2^(1/2)+(1/a^2)^(1/2))/(x^2-(1/a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1/2)))
-1/6/a*(1/a^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x+1)-1/6/a*(1/a^2
)^(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x-1)
```

Maxima [B] time = 1.50193, size = 342, normalized size = 2.28

$$\frac{1}{3}x^3 \operatorname{arccot}\left(ax^2\right) - \frac{1}{12}a\left(\frac{\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{1}{4}}} - \frac{\sqrt{2}\log\left(\sqrt{a^2}x^2-\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{1}{4}}} + \frac{\sqrt{2}\log\left(\frac{2\sqrt{a^2}x-\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}{2\sqrt{a^2}x+\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}\right)}{\sqrt{-\sqrt{a^2}}} + \frac{\sqrt{2}\log\left(\frac{2\sqrt{a^2}x-\cdots}{2\sqrt{a^2}x+\cdots}\right)}{\sqrt{\cdots}}}{a^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x^2),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot(a*x^2) - 1/12*a*((sqrt(2)*log(sqrt(a^2)*x^2 + sqrt(2)*(a^2)^
(1/4)*x + 1)/(a^2)^(1/4) - sqrt(2)*log(sqrt(a^2)*x^2 - sqrt(2)*(a^2)^(1/4)*
x + 1)/(a^2)^(1/4) + sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2))
+ sqrt(2)*(a^2)^(1/4))/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*
(a^2)^(1/4)))/sqrt(-sqrt(a^2)) + sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(
-sqrt(a^2)) - sqrt(2)*(a^2)^(1/4))/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)
) - sqrt(2)*(a^2)^(1/4)))/sqrt(-sqrt(a^2)))/a^2 - 8*x/a^2)
```

Fricas [B] time = 2.30081, size = 713, normalized size = 4.75

$$\frac{4\,ax^3\arctan\left(\frac{1}{ax^2}\right) + 4\sqrt{2}a\frac{1}{a^6}^{\frac{1}{4}}\arctan\left(-\sqrt{2}a^5\frac{1}{a^6}^{\frac{3}{4}}x + \sqrt{2}\sqrt{\sqrt{2}a\frac{1}{a^6}^{\frac{1}{4}}x + a^2\sqrt{\frac{1}{a^6}} + x^2}a^5\frac{1}{a^6}^{\frac{3}{4}} - 1\right) + 4\sqrt{2}a\frac{1}{a^6}^{\frac{1}{4}}\arctan\left(-\sqrt{\cdots}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x^2),x, algorithm="fricas")
```

```
[Out] 1/12*(4*a*x^3*arctan(1/(a*x^2)) + 4*sqrt(2)*a*(a^(-6))^(1/4)*arctan(-sqrt(2
)*a^5*(a^(-6))^(3/4)*x + sqrt(2)*sqrt(sqrt(2)*a*(a^(-6))^(1/4)*x + a^2*sqrt
(a^(-6)) + x^2)*a^5*(a^(-6))^(3/4) - 1) + 4*sqrt(2)*a*(a^(-6))^(1/4)*arctan
(-sqrt(2)*a^5*(a^(-6))^(3/4)*x + sqrt(2)*sqrt(-sqrt(2)*a*(a^(-6))^(1/4)*x +
 a^2*sqrt(a^(-6)) + x^2)*a^5*(a^(-6))^(3/4) + 1) - sqrt(2)*a*(a^(-6))^(1/4)
*log(sqrt(2)*a*(a^(-6))^(1/4)*x + a^2*sqrt(a^(-6)) + x^2) + sqrt(2)*a*(a^(-
6))^(1/4)*log(-sqrt(2)*a*(a^(-6))^(1/4)*x + a^2*sqrt(a^(-6)) + x^2) + 8*x)/
a
```

Sympy [A] time = 30.4211, size = 1081, normalized size = 7.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(a*x**2),x)
```

```
[Out] Piecewise((-x**3*acot((-sqrt(2)/2 - sqrt(2)*I/2)**(-2))/3, Eq(a, -1/(x**2*(
-sqrt(2)/2 - sqrt(2)*I/2)**2))), (-x**3*acot((-sqrt(2)/2 + sqrt(2)*I/2)**(-
2))/3, Eq(a, -1/(x**2*(-sqrt(2)/2 + sqrt(2)*I/2)**2))), (-x**3*acot((sqrt(2
)/2 - sqrt(2)*I/2)**(-2))/3, Eq(a, -1/(x**2*(sqrt(2)/2 - sqrt(2)*I/2)**2)))
, (-x**3*acot((sqrt(2)/2 + sqrt(2)*I/2)**(-2))/3, Eq(a, -1/(x**2*(sqrt(2)/2
 + sqrt(2)*I/2)**2))), (pi*x**3/6, Eq(a, 0)), (-2*(-1)**(1/4)*a**8*x**7*(a*
*(-2))**(13/4)*acot(a*x**2)/(-6*(-1)**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6
*(-1)**(1/4)*a**6*(a**(-2))**(13/4)) - 4*(-1)**(1/4)*a**7*x**5*(a**(-2))**(
13/4)/(-6*(-1)**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**
(-2))**(13/4)) - 2*(-1)**(1/4)*a**6*x**3*(a**(-2))**(13/4)*acot(a*x**2)/(-6
*(-1)**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(1
3/4)) - 2*I*a**5*x**4*(a**(-2))**(5/2)*log(x - (-1)**(1/4)*(a**(-2))**(1/4)
)/(-6*(-1)**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2)
)**(13/4)) + I*a**5*x**4*(a**(-2))**(5/2)*log(x**2 + I*sqrt(a**(-2)))/(-6*(
-1)**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(13/
4)) - 2*I*a**5*x**4*(a**(-2))**(5/2)*atan((-1)**(3/4)*x/(a**(-2))**(1/4))/(
-6*(-1)**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**
(13/4)) - 4*(-1)**(1/4)*a**5*x*(a**(-2))**(13/4)/(-6*(-1)**(1/4)*a**8*x**4*
(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(13/4)) - 2*I*a**3*(a**(-
2))**(5/2)*log(x - (-1)**(1/4)*(a**(-2))**(1/4))/(-6*(-1)**(1/4)*a**8*x**4*
(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(13/4)) + I*a**3*(a**(-2)
)**(5/2)*log(x**2 + I*sqrt(a**(-2)))/(-6*(-1)**(1/4)*a**8*x**4*(a**(-2))**(
13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(13/4)) - 2*I*a**3*(a**(-2))**(5/2)*a
tan((-1)**(3/4)*x/(a**(-2))**(1/4))/(-6*(-1)**(1/4)*a**8*x**4*(a**(-2))**(1
3/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(13/4)) + 2*x**4*acot(a*x**2)/(-6*(-1)
```

```
**(1/4)*a**8*x**4*(a**(-2))**(13/4) - 6*(-1)**(1/4)*a**6*(a**(-2))**(13/4))
 + 2*acot(a*x**2)/(-6*(-1)**(1/4)*a**10*x**4*(a**(-2))**(13/4) - 6*(-1)**(1
/4)*a**8*(a**(-2))**(13/4)), True))
```

Giac [A] time = 1.11955, size = 207, normalized size = 1.38

$$\frac{1}{3}x^3\arctan\left(\frac{1}{ax^2}\right)+\frac{1}{12}a\left(\frac{8x}{a^2}-\frac{2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{a^2\sqrt{|a|}}-\frac{2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{a^2\sqrt{|a|}}-\frac{\sqrt{2}\log\left(\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a*x^2),x, algorithm="giac")
```

```
[Out] 1/3*x^3*arctan(1/(a*x^2)) + 1/12*a*(8*x/a^2 - 2*sqrt(2)*arctan(1/2*sqrt(2)*
(2*x + sqrt(2)/sqrt(abs(a)))*sqrt(abs(a)))/(a^2*sqrt(abs(a))) - 2*sqrt(2)*a
rctan(1/2*sqrt(2)*(2*x - sqrt(2)/sqrt(abs(a)))*sqrt(abs(a)))/(a^2*sqrt(abs(
a))) - sqrt(2)*log(x^2 + sqrt(2)*x/sqrt(abs(a)) + 1/abs(a))/(a^2*sqrt(abs(a
))) + sqrt(2)*log(x^2 - sqrt(2)*x/sqrt(abs(a)) + 1/abs(a))/(a^2*sqrt(abs(a)
)))
```

3.82 $\int \cot^{-1}(ax^2)\,dx$

Optimal. Leaf size=132

$$\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}\sqrt{a}}-\frac{\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}\sqrt{a}}+x\cot^{-1}\left(ax^2\right)-\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}\sqrt{a}}+\frac{\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{\sqrt{2}\sqrt{a}}$$

```
[Out] x*ArcCot[a*x^2] - ArcTan[1 - Sqrt[2]*Sqrt[a]*x]/(Sqrt[2]*Sqrt[a]) + ArcTan[
1 + Sqrt[2]*Sqrt[a]*x]/(Sqrt[2]*Sqrt[a]) + Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^
2]/(2*Sqrt[2]*Sqrt[a]) - Log[1 + Sqrt[2]*Sqrt[a]*x + a*x^2]/(2*Sqrt[2]*Sqrt
[a])
```

Rubi [A] time = 0.0760943, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.167, Rules used = {5028, 297, 1162, 617, 204, 1165, 628}

$$\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}\sqrt{a}}-\frac{\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}\sqrt{a}}+x\cot^{-1}\left(ax^2\right)-\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}\sqrt{a}}+\frac{\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{\sqrt{2}\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^2],x]
```


```
[Out] x*ArcCot[a*x^2] - ArcTan[1 - Sqrt[2]*Sqrt[a]*x]/(Sqrt[2]*Sqrt[a]) + ArcTan[
1 + Sqrt[2]*Sqrt[a]*x]/(Sqrt[2]*Sqrt[a]) + Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^
2]/(2*Sqrt[2]*Sqrt[a]) - Log[1 + Sqrt[2]*Sqrt[a]*x + a*x^2]/(2*Sqrt[2]*Sqrt
[a])
```


Rule 5028

```
Int[ArcCot[(c_.)*(x_)^(n_)], x_Symbol] :> Simp[x*ArcCot[c*x^n], x] + Dist[c
*n, Int[x^n/(1 + c^2*x^(2*n)), x], x] /; FreeQ[{c, n}, x]
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rubi steps

$$\begin{aligned}\int \cot^{-1}\left(ax^2\right)dx &= x\cot^{-1}\left(ax^2\right)+(2a)\int \frac{x^2}{1+a^2x^4}\,dx\\ &= x\cot^{-1}\left(ax^2\right)-\int \frac{1-ax^2}{1+a^2x^4}\,dx+\int \frac{1+ax^2}{1+a^2x^4}\,dx\\ &= x\cot^{-1}\left(ax^2\right)+\frac{\int \frac{1}{\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}+x^2}dx}{2a}+\frac{\int \frac{1}{\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}+x^2}dx}{2a}+\frac{\int \frac{\frac{\sqrt{2}}{\sqrt{a}}+2x}{-\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}-x^2}dx}{2\sqrt{2}\sqrt{a}}+\frac{\int \frac{\frac{\sqrt{2}}{\sqrt{a}}-2x}{-\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}-x^2}dx}{2\sqrt{2}\sqrt{a}}\\ &= x\cot^{-1}\left(ax^2\right)+\frac{\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{2\sqrt{2}\sqrt{a}}-\frac{\log\left(1+\sqrt{2}\sqrt{a}x+ax^2\right)}{2\sqrt{2}\sqrt{a}}+\frac{\mathrm{Subst}\left(\int \frac{1}{-1-x^2}dx,x,1-\sqrt{2}\sqrt{a}\right.}{\sqrt{2}\sqrt{a}}\\ &= x\cot^{-1}\left(ax^2\right)-\frac{\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}\sqrt{a}}+\frac{\tan^{-1}\left(1+\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}\sqrt{a}}+\frac{\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{2\sqrt{2}\sqrt{a}}-\frac{\log\left(1+\sqrt{2}\right.}{2\sqrt{2}}\end{aligned}$$

Mathematica [A] time = 0.0337439, size = 102, normalized size = 0.77

$$x\cot^{-1}\left(ax^2\right)+\frac{\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)-\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)-2\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)+2\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^2],x]
```

```
[Out] x*ArcCot[a*x^2] + (-2*ArcTan[1 - Sqrt[2]*Sqrt[a]*x] + 2*ArcTan[1 + Sqrt[2]*
Sqrt[a]*x] + Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^2] - Log[1 + Sqrt[2]*Sqrt[a]*x
 + a*x^2])/(2*Sqrt[2]*Sqrt[a])
```

Maple [A] time = 0.041, size = 118, normalized size = 0.9

$$x\mathrm{arccot}\left(ax^2\right)+\frac{\sqrt{2}}{4\,a}\ln\left(\left(x^2-\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)\left(x^2+\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)^{-1}\right)\frac{1}{\sqrt[4]{a^{-2}}}+\frac{\sqrt{2}}{2\,a}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{a^{-2}}}+1\right)\frac{1}{\sqrt[4]{a^{-2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^2),x)
```

```
[Out] x*arccot(a*x^2)+1/4/a/(1/a^2)^(1/4)*2^(1/2)*ln((x^2-(1/a^2)^(1/4)*x*2^(1/2)
+(1/a^2)^(1/2))/(x^2+(1/a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1/2)))+1/2/a/(1/a^2)^
```

```
(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x+1)+1/2/a/(1/a^2)^(1/4)*2^(1/2)
*arctan(2^(1/2)/(1/a^2)^(1/4)*x-1)
```

Maxima [B] time = 1.51113, size = 339, normalized size = 2.57

$$-\frac{1}{4}a\left(\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2-\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\frac{2\sqrt{a^2}x-\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}{2\sqrt{a^2}x+\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}\right)}{\sqrt{a^2}\sqrt{-\sqrt{a^2}}}-\frac{\sqrt{2}\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2),x, algorithm="maxima")
```

```
[Out] -1/4*a*(sqrt(2)*log(sqrt(a^2)*x^2 + sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(3/4)
- sqrt(2)*log(sqrt(a^2)*x^2 - sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(3/4) - sqrt
(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4))/(2
*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4)))/(sqrt(a^2)*
sqrt(-sqrt(a^2))) - sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2)) -
 sqrt(2)*(a^2)^(1/4))/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) - sqrt(2)*(
a^2)^(1/4)))/(sqrt(a^2)*sqrt(-sqrt(a^2)))) + x*arccot(a*x^2)
```

Fricas [A] time = 2.24999, size = 647, normalized size = 4.9

$$x\arctan\left(\frac{1}{ax^2}\right)-\sqrt{2}\frac{1}{a^2}^{\frac{1}{4}}\arctan\left(-\sqrt{2}a\frac{1}{a^2}^{\frac{1}{4}}x+\sqrt{2}\sqrt{\sqrt{2}a\frac{1}{a^2}^{\frac{3}{4}}x+x^2+\sqrt{\frac{1}{a^2}}}a\frac{1}{a^2}^{\frac{1}{4}}-1\right)-\sqrt{2}\frac{1}{a^2}^{\frac{1}{4}}\arctan\left(-\sqrt{2}a\frac{1}{a^2}^{\frac{1}{4}}x+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2),x, algorithm="fricas")
```

```
[Out] x*arctan(1/(a*x^2)) - sqrt(2)*(a^(-2))^(1/4)*arctan(-sqrt(2)*a*(a^(-2))^(1/
4)*x + sqrt(2)*sqrt(sqrt(2)*a*(a^(-2))^(3/4)*x + x^2 + sqrt(a^(-2)))*a*(a^(
-2))^(1/4) - 1) - sqrt(2)*(a^(-2))^(1/4)*arctan(-sqrt(2)*a*(a^(-2))^(1/4)*x
 + sqrt(2)*sqrt(-sqrt(2)*a*(a^(-2))^(3/4)*x + x^2 + sqrt(a^(-2)))*a*(a^(-2)
)^(1/4) + 1) - 1/4*sqrt(2)*(a^(-2))^(1/4)*log(sqrt(2)*a*(a^(-2))^(3/4)*x +
x^2 + sqrt(a^(-2))) + 1/4*sqrt(2)*(a^(-2))^(1/4)*log(-sqrt(2)*a*(a^(-2))^(3
```

```
/4)*x + x^2 + sqrt(a^(-2)))
```

Sympy [A] time = 14.9019, size = 440, normalized size = 3.33

$$\begin{cases} \frac{\pi x}{2} \\ \infty i x \\ -\infty i x \\ -\frac{2(-1)^{\frac{3}{4}} a^7 x^4 \left(\frac{1}{a^2}\right)^{\frac{11}{4}} \log\left(x - \sqrt[4]{-1}\sqrt[4]{\frac{1}{a^2}}\right)}{2a^2x^4+2} + \frac{(-1)^{\frac{3}{4}} a^7 x^4 \left(\frac{1}{a^2}\right)^{\frac{11}{4}} \log\left(x^2 + i\sqrt{\frac{1}{a^2}}\right)}{2a^2x^4+2} + \frac{2(-1)^{\frac{3}{4}} a^7 x^4 \left(\frac{1}{a^2}\right)^{\frac{11}{4}} \operatorname{atan}\left(\frac{(-1)^{\frac{3}{4}} x}{\sqrt[4]{\frac{1}{a^2}}}\right)}{2a^2x^4+2} - \frac{2(-1)^{\frac{3}{4}} a^5 \left(\frac{1}{a^2}\right)^{\frac{11}{4}} \log\left(x - \sqrt[4]{-1}\sqrt[4]{\frac{1}{a^2}}\right)}{2a^2x^4+2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**2),x)
```

```
[Out] Piecewise((pi*x/2, Eq(a, 0)), (oo*I*x, Eq(a, -I/x**2)), (-oo*I*x, Eq(a, I/x
**2)), (-2*(-1)**(3/4)*a**7*x**4*(a**(-2))**(11/4)*log(x - (-1)**(1/4)*(a**
(-2))**(1/4))/(2*a**2*x**4 + 2) + (-1)**(3/4)*a**7*x**4*(a**(-2))**(11/4)*l
og(x**2 + I*sqrt(a**(-2)))/(2*a**2*x**4 + 2) + 2*(-1)**(3/4)*a**7*x**4*(a**
(-2))**(11/4)*atan((-1)**(3/4)*x/(a**(-2))**(1/4))/(2*a**2*x**4 + 2) - 2*(-
1)**(3/4)*a**5*(a**(-2))**(11/4)*log(x - (-1)**(1/4)*(a**(-2))**(1/4))/(2*a
**2*x**4 + 2) + (-1)**(3/4)*a**5*(a**(-2))**(11/4)*log(x**2 + I*sqrt(a**(-2
)))/(2*a**2*x**4 + 2) + 2*(-1)**(3/4)*a**5*(a**(-2))**(11/4)*atan((-1)**(3/
4)*x/(a**(-2))**(1/4))/(2*a**2*x**4 + 2) + 2*(-1)**(1/4)*a**4*x**4*(a**(-2)
)**(5/4)*acot(a*x**2)/(2*a**2*x**4 + 2) + 2*(-1)**(1/4)*a**4*(a**(-2))**(9/
4)*acot(a*x**2)/(2*a**2*x**4 + 2) + 2*a**2*x**5*acot(a*x**2)/(2*a**2*x**4 +
 2) + 2*x*acot(a*x**2)/(2*a**2*x**4 + 2), True))
```

Giac [A] time = 1.09722, size = 194, normalized size = 1.47

$$\frac{1}{4}a\left(\frac{2\sqrt{2}\sqrt{|a|}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x + \frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{a^2} + \frac{2\sqrt{2}\sqrt{|a|}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x - \frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{a^2} - \frac{\sqrt{2}\sqrt{|a|}\log\left(x^2 + \frac{\sqrt{2}x}{\sqrt{|a|}} + \frac{1}{|a|}\right)}{a^2} + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2),x, algorithm="giac")
```

```
[Out] 1/4*a*(2*sqrt(2)*sqrt(abs(a))*arctan(1/2*sqrt(2)*(2*x + sqrt(2)/sqrt(abs(a)
))*sqrt(abs(a)))/a^2 + 2*sqrt(2)*sqrt(abs(a))*arctan(1/2*sqrt(2)*(2*x - sqr
t(2)/sqrt(abs(a)))*sqrt(abs(a)))/a^2 - sqrt(2)*sqrt(abs(a))*log(x^2 + sqrt(
2)*x/sqrt(abs(a)) + 1/abs(a))/a^2 + sqrt(2)*sqrt(abs(a))*log(x^2 - sqrt(2)*
x/sqrt(abs(a)) + 1/abs(a))/a^2) + x*arctan(1/(a*x^2))
```

3.83 $\int \frac{\cot^{-1}(ax^2)}{x^2}\,dx$

Optimal. Leaf size=135

$$\frac{\sqrt{a}\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}}-\frac{\sqrt{a}\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}}-\frac{\cot^{-1}\left(ax^2\right)}{x}+\frac{\sqrt{a}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}}-\frac{\sqrt{a}\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{\sqrt{2}}$$

```
[Out] -(ArcCot[a*x^2]/x) + (Sqrt[a]*ArcTan[1 - Sqrt[2]*Sqrt[a]*x])/Sqrt[2] - (Sqr
t[a]*ArcTan[1 + Sqrt[2]*Sqrt[a]*x])/Sqrt[2] + (Sqrt[a]*Log[1 - Sqrt[2]*Sqrt
[a]*x + a*x^2])/(2*Sqrt[2]) - (Sqrt[a]*Log[1 + Sqrt[2]*Sqrt[a]*x + a*x^2])/
(2*Sqrt[2])
```

Rubi [A] time = 0.0786399, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {5034, 211, 1165, 628, 1162, 617, 204}

$$\frac{\sqrt{a}\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}}-\frac{\sqrt{a}\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{2\sqrt{2}}-\frac{\cot^{-1}\left(ax^2\right)}{x}+\frac{\sqrt{a}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}}-\frac{\sqrt{a}\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^2]/x^2,x]
```



```
[Out] -(ArcCot[a*x^2]/x) + (Sqrt[a]*ArcTan[1 - Sqrt[2]*Sqrt[a]*x])/Sqrt[2] - (Sqr
t[a]*ArcTan[1 + Sqrt[2]*Sqrt[a]*x])/Sqrt[2] + (Sqrt[a]*Log[1 - Sqrt[2]*Sqrt
[a]*x + a*x^2])/(2*Sqrt[2]) - (Sqrt[a]*Log[1 + Sqrt[2]*Sqrt[a]*x + a*x^2])/
(2*Sqrt[2])
```


Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 211

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[a/b, 2]
], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*r), Int[(r - s*x^2)/(a + b*x^4),
 x], x] + Dist[1/(2*r), Int[(r + s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a, b
```

```
}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &&
AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\cot^{-1}(ax^2)}{x^2}\,dx = -\frac{\cot^{-1}(ax^2)}{x} - (2a)\int \frac{1}{1+a^2x^4}\,dx$$
$$= -\frac{\cot^{-1}(ax^2)}{x} - a\int \frac{1-ax^2}{1+a^2x^4}\,dx - a\int \frac{1+ax^2}{1+a^2x^4}\,dx$$
$$= -\frac{\cot^{-1}(ax^2)}{x} - \frac{1}{2}\int \frac{1}{\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx - \frac{1}{2}\int \frac{1}{\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx + \frac{\sqrt{a}\int \frac{\frac{\sqrt{2}}{\sqrt{a}}+2x}{-\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}-x^2}\,dx}{2\sqrt{2}} + \frac{\sqrt{a}\int \frac{\frac{\sqrt{2}}{\sqrt{a}}-2x}{-\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}-}}{2\sqrt{2}}$$
$$= -\frac{\cot^{-1}(ax^2)}{x} + \frac{\sqrt{a}\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{2\sqrt{2}} - \frac{\sqrt{a}\log\left(1+\sqrt{2}\sqrt{a}x+ax^2\right)}{2\sqrt{2}} - \frac{\sqrt{a}\,\mathrm{Subst}\left(\int \frac{1}{-1-x^2}\,dx, x\right.}{\sqrt{2}}$$
$$= -\frac{\cot^{-1}(ax^2)}{x} + \frac{\sqrt{a}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}} - \frac{\sqrt{a}\tan^{-1}\left(1+\sqrt{2}\sqrt{a}x\right)}{\sqrt{2}} + \frac{\sqrt{a}\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{2\sqrt{2}} - $$

Mathematica [A] time = 0.0397873, size = 105, normalized size = 0.78

$$\frac{\sqrt{a}\left(\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)-\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)+2\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)-2\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)\right)}{2\sqrt{2}} - \frac{\cot^{-1}(ax^2)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^2]/x^2,x]
```

```
[Out] -(ArcCot[a*x^2]/x) + (Sqrt[a]*(2*ArcTan[1 - Sqrt[2]*Sqrt[a]*x] - 2*ArcTan[1
 + Sqrt[2]*Sqrt[a]*x] + Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^2] - Log[1 + Sqrt[2
]*Sqrt[a]*x + a*x^2]))/(2*Sqrt[2])
```

Maple [A] time = 0.042, size = 115, normalized size = 0.9

$$-\frac{\operatorname{arccot}(ax^2)}{x} - \frac{a\sqrt{2}}{2}\sqrt[4]{a^{-2}}\arctan\left(\sqrt{2}x\frac{1}{\sqrt[4]{a^{-2}}}-1\right) - \frac{a\sqrt{2}}{4}\sqrt[4]{a^{-2}}\ln\left(\left(x^2+\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)\left(x^2-\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)^{-1}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^2)/x^2,x)
```

```
[Out] -arccot(a*x^2)/x-1/2*a*(1/a^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x
-1)-1/4*a*(1/a^2)^(1/4)*2^(1/2)*ln((x^2+(1/a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1/
2))/(x^2-(1/a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1/2)))-1/2*a*(1/a^2)^(1/4)*2^(1/2
)*arctan(2^(1/2)/(1/a^2)^(1/4)*x+1)
```

Maxima [B] time = 1.49246, size = 327, normalized size = 2.42

$$-\frac{1}{4}\left(\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{1}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2-\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{1}{4}}}+\frac{\sqrt{2}\log\left(\frac{2\sqrt{a^2}x-\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}{2\sqrt{a^2}x+\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}\right)}{\sqrt{-\sqrt{a^2}}}+\frac{\sqrt{2}\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^2,x, algorithm="maxima")
```

```
[Out] -1/4*(sqrt(2)*log(sqrt(a^2)*x^2 + sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(1/4) -
sqrt(2)*log(sqrt(a^2)*x^2 - sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(1/4) + sqrt(2
)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4))/(2*s
qrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4)))/sqrt(-sqrt(a^
2)) + sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2)) - sqrt(2)*(a^2)
^(1/4))/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) - sqrt(2)*(a^2)^(1/4)))/s
qrt(-sqrt(a^2)))*a - arccot(a*x^2)/x
```

Fricas [B] time = 2.31341, size = 633, normalized size = 4.69

$$\frac{4\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x\arctan\left(-\frac{\sqrt{2}\left(a^2\right)^{\frac{3}{4}}ax+a^2-\sqrt{2}\sqrt{a^2x^2+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}ax+\sqrt{a^2}}\left(a^2\right)^{\frac{3}{4}}}{a^2}\right)+4\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x\arctan\left(-\frac{\sqrt{2}\left(a^2\right)^{\frac{3}{4}}ax-a^2-\sqrt{2}\sqrt{a^2x^2-\sqrt{2}\left(a^2\right)^{\frac{1}{4}}ax+}}{a^2}\right.}{4x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^2,x, algorithm="fricas")
```

```
[Out] 1/4*(4*sqrt(2)*(a^2)^(1/4)*x*arctan(-(sqrt(2)*(a^2)^(3/4)*a*x + a^2 - sqrt(
2)*sqrt(a^2*x^2 + sqrt(2)*(a^2)^(1/4)*a*x + sqrt(a^2))*(a^2)^(3/4))/a^2) +
4*sqrt(2)*(a^2)^(1/4)*x*arctan(-(sqrt(2)*(a^2)^(3/4)*a*x - a^2 - sqrt(2)*sq
```

```
rt(a^2*x^2 - sqrt(2)*(a^2)^(1/4)*a*x + sqrt(a^2))*(a^2)^(3/4))/a^2) - sqrt(
2)*(a^2)^(1/4)*x*log(a^2*x^2 + sqrt(2)*(a^2)^(1/4)*a*x + sqrt(a^2)) + sqrt(
2)*(a^2)^(1/4)*x*log(a^2*x^2 - sqrt(2)*(a^2)^(1/4)*a*x + sqrt(a^2)) - 4*arc
tan(1/(a*x^2)))/x
```

Sympy [A] time = 30.0655, size = 462, normalized size = 3.42

$$\begin{cases} -\frac{\infty i}{x} \\ \frac{\infty i}{x} \\ -\frac{\pi}{2x} \\ \frac{2(-1)^{\frac{3}{4}}a^5x^5\left(\frac{1}{a^2}\right)^{\frac{7}{4}}\operatorname{acot}\left(ax^2\right)}{2ax^5+\frac{2x}{a}} + \frac{2\sqrt[4]{-1}a^4x^5\left(\frac{1}{a^2}\right)^{\frac{5}{4}}\log\left(x-\sqrt[4]{-1}\sqrt[4]{\frac{1}{a^2}}\right)}{2ax^5+\frac{2x}{a}} - \frac{\sqrt[4]{-1}a^4x^5\left(\frac{1}{a^2}\right)^{\frac{5}{4}}\log\left(x^2+i\sqrt{\frac{1}{a^2}}\right)}{2ax^5+\frac{2x}{a}} + \frac{2\sqrt[4]{-1}a^4x^5\left(\frac{1}{a^2}\right)^{\frac{5}{4}}\operatorname{atan}\left(\frac{(-1)^{\frac{3}{4}}x}{\sqrt[4]{\frac{1}{a^2}}}\right)}{2ax^5+\frac{2x}{a}} + \frac{2(-1)^{\frac{3}{4}}a^3x}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**2)/x**2,x)
```

```
[Out] Piecewise((-oo*I/x, Eq(a, -I/x**2)), (oo*I/x, Eq(a, I/x**2)), (-pi/(2*x), E
q(a, 0)), (2*(-1)**(3/4)*a**5*x**5*(a**(-2))**(7/4)*acot(a*x**2)/(2*a*x**5
+ 2*x/a) + 2*(-1)**(1/4)*a**4*x**5*(a**(-2))**(5/4)*log(x - (-1)**(1/4)*(a*
*(-2))**(1/4))/(2*a*x**5 + 2*x/a) - (-1)**(1/4)*a**4*x**5*(a**(-2))**(5/4)*
log(x**2 + I*sqrt(a**(-2)))/(2*a*x**5 + 2*x/a) + 2*(-1)**(1/4)*a**4*x**5*(a
**(-2))**(5/4)*atan((-1)**(3/4)*x/(a**(-2))**(1/4))/(2*a*x**5 + 2*x/a) + 2*
(-1)**(3/4)*a**3*x*(a**(-2))**(7/4)*acot(a*x**2)/(2*a*x**5 + 2*x/a) + 2*(-1
)**(1/4)*a**2*x*(a**(-2))**(5/4)*log(x - (-1)**(1/4)*(a**(-2))**(1/4))/(2*a
*x**5 + 2*x/a) - (-1)**(1/4)*a**2*x*(a**(-2))**(5/4)*log(x**2 + I*sqrt(a**(
-2)))/(2*a*x**5 + 2*x/a) + 2*(-1)**(1/4)*a**2*x*(a**(-2))**(5/4)*atan((-1)*
*(3/4)*x/(a**(-2))**(1/4))/(2*a*x**5 + 2*x/a) - 2*a*x**4*acot(a*x**2)/(2*a*
x**5 + 2*x/a) - 2*acot(a*x**2)/(2*a**2*x**5 + 2*x), True))
```

Giac [A] time = 1.12927, size = 182, normalized size = 1.35

$$-\frac{1}{4}a\left(\frac{2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{\sqrt{|a|}} + \frac{2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)}{\sqrt{|a|}} + \frac{\sqrt{2}\log\left(x^2+\frac{\sqrt{2}x}{\sqrt{|a|}}+\frac{1}{|a|}\right)}{\sqrt{|a|}} - \frac{\sqrt{2}\log\left(x^2\right.}{\sqrt{}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^2,x, algorithm="giac")
```

```
[Out] -1/4*a*(2*sqrt(2)*arctan(1/2*sqrt(2)*(2*x + sqrt(2)/sqrt(abs(a)))*sqrt(abs(
a)))/sqrt(abs(a)) + 2*sqrt(2)*arctan(1/2*sqrt(2)*(2*x - sqrt(2)/sqrt(abs(a)
))*sqrt(abs(a)))/sqrt(abs(a)) + sqrt(2)*log(x^2 + sqrt(2)*x/sqrt(abs(a)) +
1/abs(a))/sqrt(abs(a)) - sqrt(2)*log(x^2 - sqrt(2)*x/sqrt(abs(a)) + 1/abs(a
))/sqrt(abs(a))) - arctan(1/(a*x^2))/x
```

3.84 $\int \frac{\cot^{-1}(ax^2)}{x^4}\,dx$

Optimal. Leaf size=150

$$\frac{a^{3/2}\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}}-\frac{a^{3/2}\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}}-\frac{a^{3/2}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}}+\frac{a^{3/2}\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{3\sqrt{2}}-\frac{\cot^{-1}}{3x}$$

```
[Out] (2*a)/(3*x) - ArcCot[a*x^2]/(3*x^3) - (a^(3/2)*ArcTan[1 - Sqrt[2]*Sqrt[a]*x
])/(3*Sqrt[2]) + (a^(3/2)*ArcTan[1 + Sqrt[2]*Sqrt[a]*x])/(3*Sqrt[2]) + (a^(
3/2)*Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^2])/(6*Sqrt[2]) - (a^(3/2)*Log[1 + Sqr
t[2]*Sqrt[a]*x + a*x^2])/(6*Sqrt[2])
```

Rubi [A] time = 0.0916708, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.8, Rules used = {5034, 325, 297, 1162, 617, 204, 1165, 628}

$$\frac{a^{3/2}\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}}-\frac{a^{3/2}\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)}{6\sqrt{2}}-\frac{a^{3/2}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}}+\frac{a^{3/2}\tan^{-1}\left(\sqrt{2}\sqrt{a}x+1\right)}{3\sqrt{2}}-\frac{\cot^{-1}}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^2]/x^4,x]
```

```
[Out] (2*a)/(3*x) - ArcCot[a*x^2]/(3*x^3) - (a^(3/2)*ArcTan[1 - Sqrt[2]*Sqrt[a]*x
])/(3*Sqrt[2]) + (a^(3/2)*ArcTan[1 + Sqrt[2]*Sqrt[a]*x])/(3*Sqrt[2]) + (a^(
3/2)*Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^2])/(6*Sqrt[2]) - (a^(3/2)*Log[1 + Sqr
t[2]*Sqrt[a]*x + a*x^2])/(6*Sqrt[2])
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
```

```
b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
x]
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rubi steps

$$\int \frac{\cot^{-1}\left(ax^2\right)}{x^4}\,dx = -\frac{\cot^{-1}\left(ax^2\right)}{3x^3} - \frac{1}{3}(2a)\int \frac{1}{x^2\left(1+a^2x^4\right)}\,dx$$

$$= \frac{2a}{3x} - \frac{\cot^{-1}\left(ax^2\right)}{3x^3} + \frac{1}{3}\left(2a^3\right)\int \frac{x^2}{1+a^2x^4}\,dx$$

$$= \frac{2a}{3x} - \frac{\cot^{-1}\left(ax^2\right)}{3x^3} - \frac{1}{3}a^2\int \frac{1-ax^2}{1+a^2x^4}\,dx + \frac{1}{3}a^2\int \frac{1+ax^2}{1+a^2x^4}\,dx$$

$$= \frac{2a}{3x} - \frac{\cot^{-1}\left(ax^2\right)}{3x^3} + \frac{1}{6}a\int \frac{1}{\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx + \frac{1}{6}a\int \frac{1}{\frac{1}{a}+\frac{\sqrt{2}x}{\sqrt{a}}+x^2}\,dx + \frac{a^{3/2}\int \frac{\frac{\sqrt{2}}{\sqrt{a}}+2x}{-\frac{1}{a}-\frac{\sqrt{2}x}{\sqrt{a}}-x^2}\,dx}{6\sqrt{2}} + \frac{a^{3/2}\int}{}$$

$$= \frac{2a}{3x} - \frac{\cot^{-1}\left(ax^2\right)}{3x^3} + \frac{a^{3/2}\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right)}{6\sqrt{2}} - \frac{a^{3/2}\log\left(1+\sqrt{2}\sqrt{a}x+ax^2\right)}{6\sqrt{2}} + \frac{a^{3/2}\,\text{Subst}\left(\int \frac{1}{-1-x}\right.}{3}$$

$$= \frac{2a}{3x} - \frac{\cot^{-1}\left(ax^2\right)}{3x^3} - \frac{a^{3/2}\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}} + \frac{a^{3/2}\tan^{-1}\left(1+\sqrt{2}\sqrt{a}x\right)}{3\sqrt{2}} + \frac{a^{3/2}\log\left(1-\sqrt{2}\sqrt{a}x+ax^2\right.}{6\sqrt{2}}$$

Mathematica [A] time = 0.0514186, size = 146, normalized size = 0.97

$$\frac{ax^2\left(\sqrt{2}\sqrt{a}x\log\left(ax^2-\sqrt{2}\sqrt{a}x+1\right)-\sqrt{2}\sqrt{a}x\log\left(ax^2+\sqrt{2}\sqrt{a}x+1\right)-2\sqrt{2}\sqrt{a}x\tan^{-1}\left(1-\sqrt{2}\sqrt{a}x\right)+2\sqrt{2}\sqrt{a}x\tan^{-1}\left(\right.\right.}{12x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^2]/x^4,x]
```

```
[Out] (-4*ArcCot[a*x^2] + a*x^2*(8 - 2*Sqrt[2]*Sqrt[a]*x*ArcTan[1 - Sqrt[2]*Sqrt[
a]*x] + 2*Sqrt[2]*Sqrt[a]*x*ArcTan[1 + Sqrt[2]*Sqrt[a]*x] + Sqrt[2]*Sqrt[a]
*x*Log[1 - Sqrt[2]*Sqrt[a]*x + a*x^2] - Sqrt[2]*Sqrt[a]*x*Log[1 + Sqrt[2]*S
qrt[a]*x + a*x^2]))/(12*x^3)
```

Maple [A] time = 0.043, size = 121, normalized size = 0.8

$$-\frac{\text{arccot}\left(ax^2\right)}{3\,x^3} + \frac{a\sqrt{2}}{12}\ln\left(\left(x^2-\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)\left(x^2+\sqrt[4]{a^{-2}}x\sqrt{2}+\sqrt{a^{-2}}\right)^{-1}\right)\frac{1}{\sqrt[4]{a^{-2}}} + \frac{a\sqrt{2}}{6}\arctan\left(x\sqrt{2}\frac{1}{\sqrt[4]{a^{-2}}}+1\right)\frac{1}{\sqrt[4]{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^2)/x^4,x)
```

```
[Out] -1/3*arccot(a*x^2)/x^3+1/12*a/(1/a^2)^(1/4)*2^(1/2)*ln((x^2-(1/a^2)^(1/4)*x
*2^(1/2)+(1/a^2)^(1/2))/(x^2+(1/a^2)^(1/4)*x*2^(1/2)+(1/a^2)^(1/2)))+1/6*a/
(1/a^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x+1)+1/6*a/(1/a^2)^(1/4)
*2^(1/2)*arctan(2^(1/2)/(1/a^2)^(1/4)*x-1)+2/3*a/x
```

Maxima [B] time = 1.47613, size = 356, normalized size = 2.37

$$-\frac{1}{12}\left(a^2\left(\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\sqrt{a^2}x^2-\sqrt{2}\left(a^2\right)^{\frac{1}{4}}x+1\right)}{\left(a^2\right)^{\frac{3}{4}}}-\frac{\sqrt{2}\log\left(\frac{2\sqrt{a^2}x-\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}{2\sqrt{a^2}x+\sqrt{2}\sqrt{-\sqrt{a^2}}+\sqrt{2}\left(a^2\right)^{\frac{1}{4}}}\right)}{\sqrt{a^2}\sqrt{-\sqrt{a^2}}}-\sqrt{2}\cdots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^4,x, algorithm="maxima")
```

```
[Out] -1/12*(a^2*(sqrt(2)*log(sqrt(a^2)*x^2 + sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(3
/4) - sqrt(2)*log(sqrt(a^2)*x^2 - sqrt(2)*(a^2)^(1/4)*x + 1)/(a^2)^(3/4) -
sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4)
)/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) + sqrt(2)*(a^2)^(1/4)))/(sqrt(a
^2)*sqrt(-sqrt(a^2))) - sqrt(2)*log((2*sqrt(a^2)*x - sqrt(2)*sqrt(-sqrt(a^2
)) - sqrt(2)*(a^2)^(1/4))/(2*sqrt(a^2)*x + sqrt(2)*sqrt(-sqrt(a^2)) - sqrt(
2)*(a^2)^(1/4)))/(sqrt(a^2)*sqrt(-sqrt(a^2)))) - 8/x)*a - 1/3*arccot(a*x^2)
/x^3
```

Fricas [B] time = 2.34024, size = 706, normalized size = 4.71

$$-\frac{4\sqrt{2}\left(a^6\right)^{\frac{1}{4}}x^3\arctan\left(-\frac{\sqrt{2}\left(a^6\right)^{\frac{1}{4}}a^5x+a^6-\sqrt{2}\sqrt{a^{10}x^2+\sqrt{2}\left(a^6\right)^{\frac{3}{4}}a^5x+\sqrt{a^6}a^6}\left(a^6\right)^{\frac{1}{4}}}{a^6}\right)+4\sqrt{2}\left(a^6\right)^{\frac{1}{4}}x^3\arctan\left(-\frac{\sqrt{2}\left(a^6\right)^{\frac{1}{4}}a^5x-a^6-\sqrt{2}\sqrt{a^{10}x^2-\cdots}}{a^6}\right.\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^4,x, algorithm="fricas")
```

```
[Out] -1/12*(4*sqrt(2)*(a^6)^(1/4)*x^3*arctan(-(sqrt(2)*(a^6)^(1/4)*a^5*x + a^6 -
 sqrt(2)*sqrt(a^10*x^2 + sqrt(2)*(a^6)^(3/4)*a^5*x + sqrt(a^6)*a^6)*(a^6)^(
1/4))/a^6) + 4*sqrt(2)*(a^6)^(1/4)*x^3*arctan(-(sqrt(2)*(a^6)^(1/4)*a^5*x -
 a^6 - sqrt(2)*sqrt(a^10*x^2 - sqrt(2)*(a^6)^(3/4)*a^5*x + sqrt(a^6)*a^6)*(
a^6)^(1/4))/a^6) + sqrt(2)*(a^6)^(1/4)*x^3*log(a^10*x^2 + sqrt(2)*(a^6)^(3/
4)*a^5*x + sqrt(a^6)*a^6) - sqrt(2)*(a^6)^(1/4)*x^3*log(a^10*x^2 - sqrt(2)*
(a^6)^(3/4)*a^5*x + sqrt(a^6)*a^6) - 8*a*x^2 + 4*arctan(1/(a*x^2)))/x^3
```

Sympy [A] time = 55.3665, size = 1074, normalized size = 7.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**2)/x**4,x)
```

```
[Out] Piecewise((acot((-sqrt(2)/2 - sqrt(2)*I/2)**(-2))/(3*x**3), Eq(a, -1/(x**2*
(-sqrt(2)/2 - sqrt(2)*I/2)**2))), (acot((-sqrt(2)/2 + sqrt(2)*I/2)**(-2))/(
3*x**3), Eq(a, -1/(x**2*(-sqrt(2)/2 + sqrt(2)*I/2)**2))), (acot((sqrt(2)/2
- sqrt(2)*I/2)**(-2))/(3*x**3), Eq(a, -1/(x**2*(sqrt(2)/2 - sqrt(2)*I/2)**2
))), (acot((sqrt(2)/2 + sqrt(2)*I/2)**(-2))/(3*x**3), Eq(a, -1/(x**2*(sqrt(
2)/2 + sqrt(2)*I/2)**2))), (-pi/(6*x**3), Eq(a, 0)), (-4*(-1)**(1/4)*a**15*
x**6*(a**(-2))**(37/4)/(-6*(-1)**(1/4)*a**14*x**7*(a**(-2))**(37/4) - 6*(-1
)**(1/4)*a**12*x**3*(a**(-2))**(37/4)) + 2*(-1)**(1/4)*a**14*x**4*(a**(-2))
**(37/4)*acot(a*x**2)/(-6*(-1)**(1/4)*a**14*x**7*(a**(-2))**(37/4) - 6*(-1)
**(1/4)*a**12*x**3*(a**(-2))**(37/4)) - 4*(-1)**(1/4)*a**13*x**2*(a**(-2))*
*(37/4)/(-6*(-1)**(1/4)*a**14*x**7*(a**(-2))**(37/4) - 6*(-1)**(1/4)*a**12*
x**3*(a**(-2))**(37/4)) + 2*(-1)**(1/4)*a**12*(a**(-2))**(37/4)*acot(a*x**2
)/(-6*(-1)**(1/4)*a**14*x**7*(a**(-2))**(37/4) - 6*(-1)**(1/4)*a**12*x**3*(
a**(-2))**(37/4)) - 2*I*a**8*x**7*(a**(-2))**(11/2)*acot(a*x**2)/(-6*(-1)**
(1/4)*a**14*x**7*(a**(-2))**(37/4) - 6*(-1)**(1/4)*a**12*x**3*(a**(-2))**(3
7/4)) - 2*I*a**6*x**3*(a**(-2))**(11/2)*acot(a*x**2)/(-6*(-1)**(1/4)*a**14*
x**7*(a**(-2))**(37/4) - 6*(-1)**(1/4)*a**12*x**3*(a**(-2))**(37/4)) - 2*x*
*7*log(x - (-1)**(1/4)*(a**(-2))**(1/4))/(-6*(-1)**(1/4)*a**17*x**7*(a**(-2
))**(37/4) - 6*(-1)**(1/4)*a**15*x**3*(a**(-2))**(37/4)) + x**7*log(x**2 +
I*sqrt(a**(-2)))/(-6*(-1)**(1/4)*a**17*x**7*(a**(-2))**(37/4) - 6*(-1)**(1/
4)*a**15*x**3*(a**(-2))**(37/4)) + 2*x**7*atan((-1)**(3/4)*x/(a**(-2))**(1/
4))/(-6*(-1)**(1/4)*a**17*x**7*(a**(-2))**(37/4) - 6*(-1)**(1/4)*a**15*x**3
*(a**(-2))**(37/4)) - 2*x**3*log(x - (-1)**(1/4)*(a**(-2))**(1/4))/(-6*(-1)
**(1/4)*a**19*x**7*(a**(-2))**(37/4) - 6*(-1)**(1/4)*a**17*x**3*(a**(-2))**
```

```
(37/4)) + x**3*log(x**2 + I*sqrt(a**(-2)))/(-6*(-1)**(1/4)*a**19*x**7*(a**(
-2))**(37/4) - 6*(-1)**(1/4)*a**17*x**3*(a**(-2))**(37/4)) + 2*x**3*atan((-
1)**(3/4)*x/(a**(-2))**(1/4))/(-6*(-1)**(1/4)*a**19*x**7*(a**(-2))**(37/4)
- 6*(-1)**(1/4)*a**17*x**3*(a**(-2))**(37/4)), True))
```

Giac [A] time = 1.10934, size = 189, normalized size = 1.26

$$\frac{1}{12}\left(2\sqrt{2}\sqrt{|a|}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x+\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)+2\sqrt{2}\sqrt{|a|}\arctan\left(\frac{1}{2}\sqrt{2}\left(2x-\frac{\sqrt{2}}{\sqrt{|a|}}\right)\sqrt{|a|}\right)-\sqrt{2}\sqrt{|a|}\log\left(x^2+\frac{\sqrt{2}x}{\sqrt{|a|}}+\frac{1}{|a|}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^2)/x^4,x, algorithm="giac")
```

```
[Out] 1/12*(2*sqrt(2)*sqrt(abs(a))*arctan(1/2*sqrt(2)*(2*x + sqrt(2)/sqrt(abs(a))
)*sqrt(abs(a))) + 2*sqrt(2)*sqrt(abs(a))*arctan(1/2*sqrt(2)*(2*x - sqrt(2)/
sqrt(abs(a)))*sqrt(abs(a))) - sqrt(2)*sqrt(abs(a))*log(x^2 + sqrt(2)*x/sqrt
(abs(a)) + 1/abs(a)) + sqrt(2)*sqrt(abs(a))*log(x^2 - sqrt(2)*x/sqrt(abs(a)
) + 1/abs(a)) + 8/x)*a - 1/3*arctan(1/(a*x^2))/x^3
```

3.85 $\int x^2 \cot^{-1}\left(\sqrt{x}\right) dx$

Optimal. Leaf size=51

$$\frac{x^{5/2}}{15}-\frac{x^{3/2}}{9}+\frac{1}{3}x^3\cot^{-1}\left(\sqrt{x}\right)+\frac{\sqrt{x}}{3}-\frac{1}{3}\tan^{-1}\left(\sqrt{x}\right)$$

```
[Out] Sqrt[x]/3 - x^(3/2)/9 + x^(5/2)/15 + (x^3*ArcCot[Sqrt[x]])/3 - ArcTan[Sqrt[
x]]/3
```

Rubi [A] time = 0.0124204, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5034, 50, 63, 203}

$$\frac{x^{5/2}}{15}-\frac{x^{3/2}}{9}+\frac{1}{3}x^3\cot^{-1}\left(\sqrt{x}\right)+\frac{\sqrt{x}}{3}-\frac{1}{3}\tan^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[Sqrt[x]],x]
```

```
[Out] Sqrt[x]/3 - x^(3/2)/9 + x^(5/2)/15 + (x^3*ArcCot[Sqrt[x]])/3 - ArcTan[Sqrt[
x]]/3
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int x^2 \cot^{-1}\left(\sqrt{x}\right) dx &= \frac{1}{3}x^3 \cot^{-1}\left(\sqrt{x}\right) + \frac{1}{6}\int \frac{x^{5/2}}{1+x}\, dx \\
&= \frac{x^{5/2}}{15} + \frac{1}{3}x^3 \cot^{-1}\left(\sqrt{x}\right) - \frac{1}{6}\int \frac{x^{3/2}}{1+x}\, dx \\
&= -\frac{x^{3/2}}{9} + \frac{x^{5/2}}{15} + \frac{1}{3}x^3 \cot^{-1}\left(\sqrt{x}\right) + \frac{1}{6}\int \frac{\sqrt{x}}{1+x}\, dx \\
&= \frac{\sqrt{x}}{3} - \frac{x^{3/2}}{9} + \frac{x^{5/2}}{15} + \frac{1}{3}x^3 \cot^{-1}\left(\sqrt{x}\right) - \frac{1}{6}\int \frac{1}{\sqrt{x}(1+x)}\, dx \\
&= \frac{\sqrt{x}}{3} - \frac{x^{3/2}}{9} + \frac{x^{5/2}}{15} + \frac{1}{3}x^3 \cot^{-1}\left(\sqrt{x}\right) - \frac{1}{3}\operatorname{Subst}\left(\int \frac{1}{1+x^2}\, dx, x, \sqrt{x}\right) \\
&= \frac{\sqrt{x}}{3} - \frac{x^{3/2}}{9} + \frac{x^{5/2}}{15} + \frac{1}{3}x^3 \cot^{-1}\left(\sqrt{x}\right) - \frac{1}{3}\tan^{-1}\left(\sqrt{x}\right)
\end{aligned}$$

Mathematica [A] time = 0.0146515, size = 40, normalized size = 0.78

$$\frac{1}{45}\left(\left(3x^2-5x+15\right)\sqrt{x}+15x^3\cot^{-1}\left(\sqrt{x}\right)-15\tan^{-1}\left(\sqrt{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[Sqrt[x]],x]
```

```
[Out] (Sqrt[x]*(15 - 5*x + 3*x^2) + 15*x^3*ArcCot[Sqrt[x]] - 15*ArcTan[Sqrt[x]])/
45
```

Maple [A] time = 0.023, size = 32, normalized size = 0.6

$$-\frac{1}{9}x^{\frac{3}{2}}+\frac{1}{15}x^{\frac{5}{2}}+\frac{x^3}{3}\mathrm{arccot}\left(\sqrt{x}\right)-\frac{1}{3}\arctan\left(\sqrt{x}\right)+\frac{1}{3}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(x^(1/2)),x)
```

```
[Out] -1/9*x^(3/2)+1/15*x^(5/2)+1/3*x^3*arccot(x^(1/2))-1/3*arctan(x^(1/2))+1/3*x
^(1/2)
```

Maxima [A] time = 1.45556, size = 42, normalized size = 0.82

$$\frac{1}{3}x^3\,\mathrm{arccot}\left(\sqrt{x}\right)+\frac{1}{15}\,x^{\frac{5}{2}}-\frac{1}{9}\,x^{\frac{3}{2}}+\frac{1}{3}\,\sqrt{x}-\frac{1}{3}\,\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(x^(1/2)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot(sqrt(x)) + 1/15*x^(5/2) - 1/9*x^(3/2) + 1/3*sqrt(x) - 1/3*ar
ctan(sqrt(x))
```

Fricas [A] time = 2.22925, size = 88, normalized size = 1.73

$$\frac{1}{3}\left(x^3+1\right)\mathrm{arccot}\left(\sqrt{x}\right)+\frac{1}{45}\left(3\,x^2-5\,x+15\right)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(x^(1/2)),x, algorithm="fricas")
```

```
[Out] 1/3*(x^3 + 1)*arccot(sqrt(x)) + 1/45*(3*x^2 - 5*x + 15)*sqrt(x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\,\mathrm{acot}\left(\sqrt{x}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(x**(1/2)),x)
```

```
[Out] Integral(x**2*acot(sqrt(x)), x)
```

Giac [A] time = 1.10455, size = 42, normalized size = 0.82

$$\frac{1}{3}\,x^{3}\arctan\left(\frac{1}{\sqrt{x}}\right)+\frac{1}{15}\,x^{\frac{5}{2}}-\frac{1}{9}\,x^{\frac{3}{2}}+\frac{1}{3}\,\sqrt{x}-\frac{1}{3}\,\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(x^(1/2)),x, algorithm="giac")
```

```
[Out] 1/3*x^3*arctan(1/sqrt(x)) + 1/15*x^(5/2) - 1/9*x^(3/2) + 1/3*sqrt(x) - 1/3*
arctan(sqrt(x))
```

3.86 $\int x \cot^{-1}\left(\sqrt{x}\right) dx$

Optimal. Leaf size=42

$$\frac{x^{3/2}}{6}+\frac{1}{2}x^2\cot^{-1}\left(\sqrt{x}\right)-\frac{\sqrt{x}}{2}+\frac{1}{2}\tan^{-1}\left(\sqrt{x}\right)$$

```
[Out] -Sqrt[x]/2 + x^(3/2)/6 + (x^2*ArcCot[Sqrt[x]])/2 + ArcTan[Sqrt[x]]/2
```

Rubi [A] time = 0.0085725, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {5034, 50, 63, 203}

$$\frac{x^{3/2}}{6}+\frac{1}{2}x^2\cot^{-1}\left(\sqrt{x}\right)-\frac{\sqrt{x}}{2}+\frac{1}{2}\tan^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[Sqrt[x]],x]
```

```
[Out] -Sqrt[x]/2 + x^(3/2)/6 + (x^2*ArcCot[Sqrt[x]])/2 + ArcTan[Sqrt[x]]/2
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int x \cot^{-1}\left(\sqrt{x}\right) dx &= \frac{1}{2}x^2 \cot^{-1}\left(\sqrt{x}\right) + \frac{1}{4}\int \frac{x^{3/2}}{1+x} dx \\
&= \frac{x^{3/2}}{6} + \frac{1}{2}x^2 \cot^{-1}\left(\sqrt{x}\right) - \frac{1}{4}\int \frac{\sqrt{x}}{1+x} dx \\
&= -\frac{\sqrt{x}}{2} + \frac{x^{3/2}}{6} + \frac{1}{2}x^2 \cot^{-1}\left(\sqrt{x}\right) + \frac{1}{4}\int \frac{1}{\sqrt{x}(1+x)} dx \\
&= -\frac{\sqrt{x}}{2} + \frac{x^{3/2}}{6} + \frac{1}{2}x^2 \cot^{-1}\left(\sqrt{x}\right) + \frac{1}{2}\text{Subst}\left(\int \frac{1}{1+x^2} dx, x, \sqrt{x}\right) \\
&= -\frac{\sqrt{x}}{2} + \frac{x^{3/2}}{6} + \frac{1}{2}x^2 \cot^{-1}\left(\sqrt{x}\right) + \frac{1}{2}\tan^{-1}\left(\sqrt{x}\right)
\end{aligned}$$

Mathematica [A] time = 0.0106243, size = 33, normalized size = 0.79

$$\frac{1}{6}\left(3x^2 \cot^{-1}\left(\sqrt{x}\right) + (x-3)\sqrt{x} + 3\tan^{-1}\left(\sqrt{x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[Sqrt[x]],x]
```

```
[Out] ((-3 + x)*Sqrt[x] + 3*x^2*ArcCot[Sqrt[x]] + 3*ArcTan[Sqrt[x]])/6
```

Maple [A] time = 0.022, size = 27, normalized size = 0.6

$$\frac{1}{6}x^{\frac{3}{2}} + \frac{x^2}{2}\text{arccot}\left(\sqrt{x}\right) + \frac{1}{2}\arctan\left(\sqrt{x}\right) - \frac{1}{2}\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(x^(1/2)),x)
```

```
[Out] 1/6*x^(3/2)+1/2*x^2*arccot(x^(1/2))+1/2*arctan(x^(1/2))-1/2*x^(1/2)
```

Maxima [A] time = 1.4242, size = 35, normalized size = 0.83

$$\frac{1}{2}\,x^2\,\mathrm{arccot}\left(\sqrt{x}\right)+\frac{1}{6}\,x^{\frac{3}{2}}-\frac{1}{2}\,\sqrt{x}+\frac{1}{2}\,\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x^(1/2)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arccot(sqrt(x)) + 1/6*x^(3/2) - 1/2*sqrt(x) + 1/2*arctan(sqrt(x))
```

Fricas [A] time = 2.28035, size = 72, normalized size = 1.71

$$\frac{1}{2}\left(x^2-1\right)\mathrm{arccot}\left(\sqrt{x}\right)+\frac{1}{6}\,(x-3)\sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x^(1/2)),x, algorithm="fricas")
```

```
[Out] 1/2*(x^2 - 1)*arccot(sqrt(x)) + 1/6*(x - 3)*sqrt(x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\,\mathrm{acot}\left(\sqrt{x}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(x**(1/2)),x)
```

```
[Out] Integral(x*acot(sqrt(x)), x)
```

Giac [A] time = 1.09093, size = 35, normalized size = 0.83

$$\frac{1}{2}\,x^{2}\arctan\left(\frac{1}{\sqrt{x}}\right)+\frac{1}{6}\,x^{\frac{3}{2}}-\frac{1}{2}\,\sqrt{x}+\frac{1}{2}\,\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(x^(1/2)),x, algorithm="giac")
```

```
[Out] 1/2*x^2*arctan(1/sqrt(x)) + 1/6*x^(3/2) - 1/2*sqrt(x) + 1/2*arctan(sqrt(x))
```

3.87 $\int \cot^{-1}\left(\sqrt{x}\right)\,dx$

Optimal. Leaf size=22

$$\sqrt{x}-\tan^{-1}\left(\sqrt{x}\right)+x\cot^{-1}\left(\sqrt{x}\right)$$

```
[Out] Sqrt[x] + x*ArcCot[Sqrt[x]] - ArcTan[Sqrt[x]]
```

Rubi [A] time = 0.0055551, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {5028, 50, 63, 203}

$$\sqrt{x}-\tan^{-1}\left(\sqrt{x}\right)+x\cot^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]],x]

[Out] Sqrt[x] + x*ArcCot[Sqrt[x]] - ArcTan[Sqrt[x]]
```

Rule 5028

```
Int[ArcCot[(c_.)*(x_)^(n_)], x_Symbol] :> Simp[x*ArcCot[c*x^n], x] + Dist[c
*n, Int[x^n/(1 + c^2*x^(2*n)), x], x] /; FreeQ[{c, n}, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \cot^{-1}\left(\sqrt{x}\right) dx &= x\cot^{-1}\left(\sqrt{x}\right) + \frac{1}{2}\int \frac{\sqrt{x}}{1+x}\,dx \\
&= \sqrt{x} + x\cot^{-1}\left(\sqrt{x}\right) - \frac{1}{2}\int \frac{1}{\sqrt{x}(1+x)}\,dx \\
&= \sqrt{x} + x\cot^{-1}\left(\sqrt{x}\right) - \text{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, \sqrt{x}\right) \\
&= \sqrt{x} + x\cot^{-1}\left(\sqrt{x}\right) - \tan^{-1}\left(\sqrt{x}\right)
\end{aligned}$$

Mathematica [A] time = 0.005846, size = 22, normalized size = 1.

$$\sqrt{x} - \tan^{-1}\left(\sqrt{x}\right) + x\cot^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]],x]
```

```
[Out] Sqrt[x] + x*ArcCot[Sqrt[x]] - ArcTan[Sqrt[x]]
```

Maple [A] time = 0.023, size = 17, normalized size = 0.8

$$x\text{arccot}\left(\sqrt{x}\right) - \arctan\left(\sqrt{x}\right) + \sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2)),x)
```

```
[Out] x*arccot(x^(1/2))-arctan(x^(1/2))+x^(1/2)
```

Maxima [A] time = 1.45385, size = 22, normalized size = 1.

$$x \operatorname{arccot}\left(\sqrt{x}\right) + \sqrt{x} - \arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2)),x, algorithm="maxima")
```

```
[Out] x*arccot(sqrt(x)) + sqrt(x) - arctan(sqrt(x))
```

Fricas [A] time = 2.21215, size = 47, normalized size = 2.14

$$(x+1) \operatorname{arccot}\left(\sqrt{x}\right) + \sqrt{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2)),x, algorithm="fricas")
```

```
[Out] (x + 1)*arccot(sqrt(x)) + sqrt(x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}\left(\sqrt{x}\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2)),x)
```

```
[Out] Integral(acot(sqrt(x)), x)
```

Giac [A] time = 1.10771, size = 22, normalized size = 1.

$$x \arctan\left(\frac{1}{\sqrt{x}}\right) + \sqrt{x} - \arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2)),x, algorithm="giac")
```

```
[Out] x*arctan(1/sqrt(x)) + sqrt(x) - arctan(sqrt(x))
```

3.88 $\int \frac{\cot^{-1}(\sqrt{x})}{x} \, dx$

Optimal. Leaf size=31

$$i\text{PolyLog}\left(2,\frac{i}{\sqrt{x}}\right)-i\text{PolyLog}\left(2,-\frac{i}{\sqrt{x}}\right)$$

```
[Out] (-I)*PolyLog[2, (-I)/Sqrt[x]] + I*PolyLog[2, I/Sqrt[x]]
```

Rubi [A] time = 0.0322822, antiderivative size = 31, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5032, 4849, 2391}

$$i\text{PolyLog}\left(2,\frac{i}{\sqrt{x}}\right)-i\text{PolyLog}\left(2,-\frac{i}{\sqrt{x}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]]/x,x]
```

```
[Out] (-I)*PolyLog[2, (-I)/Sqrt[x]] + I*PolyLog[2, I/Sqrt[x]]
```

Rule 5032

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1
/n, Subst[Int[(a + b*ArcCot[c*x])^p/x, x], x, x^n], x] /; FreeQ[{a, b, c, n
}, x] && IGtQ[p, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x}\,dx = 2\,\text{Subst}\left(\int \frac{\cot^{-1}(x)}{x}\,dx, x, \sqrt{x}\right)$$
$$= i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x}\,dx, x, \sqrt{x}\right) - i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x}\,dx, x, \sqrt{x}\right)$$
$$= -i\text{Li}_2\left(-\frac{i}{\sqrt{x}}\right) + i\text{Li}_2\left(\frac{i}{\sqrt{x}}\right)$$

Mathematica [A] time = 0.0051538, size = 31, normalized size = 1.

$$i\text{PolyLog}\left(2, \frac{i}{\sqrt{x}}\right) - i\text{PolyLog}\left(2, -\frac{i}{\sqrt{x}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]]/x,x]
```

```
[Out] (-I)*PolyLog[2, (-I)/Sqrt[x]] + I*PolyLog[2, I/Sqrt[x]]
```

Maple [B] time = 0.033, size = 61, normalized size = 2.

$$\ln(x)\,\text{arccot}\left(\sqrt{x}\right) - \frac{i}{2}\ln(x)\ln\left(1+i\sqrt{x}\right) + \frac{i}{2}\ln(x)\ln\left(1-i\sqrt{x}\right) - i\text{dilog}\left(1+i\sqrt{x}\right) + i\text{dilog}\left(1-i\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2))/x,x)
```

```
[Out] ln(x)*arccot(x^(1/2))-1/2*I*ln(x)*ln(1+I*x^(1/2))+1/2*I*ln(x)*ln(1-I*x^(1/2
))-I*dilog(1+I*x^(1/2))+I*dilog(1-I*x^(1/2))
```

Maxima [B] time = 1.58263, size = 47, normalized size = 1.52

$$\frac{1}{2}\pi\log(x+1) + \text{arccot}\left(\sqrt{x}\right)\log(x) + i\,\text{Li}_2\left(i\sqrt{x}+1\right) - i\,\text{Li}_2\left(-i\sqrt{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x,x, algorithm="maxima")
```

```
[Out] 1/2*pi*log(x + 1) + arccot(sqrt(x))*log(x) + I*dilog(I*sqrt(x) + 1) - I*dil
og(-I*sqrt(x) + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}\left(\sqrt{x}\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(sqrt(x))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}\left(\sqrt{x}\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2))/x,x)
```

```
[Out] Integral(acot(sqrt(x))/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(\sqrt{x}\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(sqrt(x))/x, x)
```

3.89 $\int \frac{\cot^{-1}(\sqrt{x})}{x^2} dx$

Optimal. Leaf size=23

$$\frac{1}{\sqrt{x}} + \tan^{-1}\left(\sqrt{x}\right) - \frac{\cot^{-1}\left(\sqrt{x}\right)}{x}$$

```
[Out] 1/Sqrt[x] - ArcCot[Sqrt[x]]/x + ArcTan[Sqrt[x]]
```

Rubi [A] time = 0.0109688, antiderivative size = 23, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5034, 51, 63, 203}

$$\frac{1}{\sqrt{x}} + \tan^{-1}\left(\sqrt{x}\right) - \frac{\cot^{-1}\left(\sqrt{x}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]]/x^2,x]
```

```
[Out] 1/Sqrt[x] - ArcCot[Sqrt[x]]/x + ArcTan[Sqrt[x]]
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x^2}\,dx &= -\frac{\cot^{-1}\left(\sqrt{x}\right)}{x}-\frac{1}{2}\int \frac{1}{x^{3/2}(1+x)}\,dx\\
&= \frac{1}{\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{x}+\frac{1}{2}\int \frac{1}{\sqrt{x}(1+x)}\,dx\\
&= \frac{1}{\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{x}+\text{Subst}\left(\int \frac{1}{1+x^2}\,dx,x,\sqrt{x}\right)\\
&= \frac{1}{\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{x}+\tan^{-1}\left(\sqrt{x}\right)
\end{aligned}
$$

Mathematica [C] time = 0.0087166, size = 29, normalized size = 1.26

$$
\frac{{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-x\right)}{\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{x}
$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]]/x^2,x]
```

```
[Out] -(ArcCot[Sqrt[x]]/x) + Hypergeometric2F1[-1/2, 1, 1/2, -x]/Sqrt[x]
```

Maple [A] time = 0.024, size = 18, normalized size = 0.8

$$
-\frac{1}{x}\text{arccot}\left(\sqrt{x}\right)+\arctan\left(\sqrt{x}\right)+\frac{1}{\sqrt{x}}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2))/x^2,x)
```

```
[Out] -arccot(x^(1/2))/x+arctan(x^(1/2))+1/x^(1/2)
```

Maxima [A] time = 1.46619, size = 23, normalized size = 1.

$$-\frac{\operatorname{arccot}\left(\sqrt{x}\right)}{x}+\frac{1}{\sqrt{x}}+\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^2,x, algorithm="maxima")
```

```
[Out] -arccot(sqrt(x))/x + 1/sqrt(x) + arctan(sqrt(x))
```

Fricas [A] time = 2.26882, size = 54, normalized size = 2.35

$$-\frac{(x+1)\operatorname{arccot}\left(\sqrt{x}\right)-\sqrt{x}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^2,x, algorithm="fricas")
```

```
[Out] -((x + 1)*arccot(sqrt(x)) - sqrt(x))/x
```

Sympy [B] time = 3.07875, size = 92, normalized size = 4.

$$-\frac{x^{\frac{5}{2}}\operatorname{acot}\left(\sqrt{x}\right)}{x^{\frac{5}{2}}+x^{\frac{3}{2}}}-\frac{2x^{\frac{3}{2}}\operatorname{acot}\left(\sqrt{x}\right)}{x^{\frac{5}{2}}+x^{\frac{3}{2}}}-\frac{\sqrt{x}\operatorname{acot}\left(\sqrt{x}\right)}{x^{\frac{5}{2}}+x^{\frac{3}{2}}}+\frac{x^{2}}{x^{\frac{5}{2}}+x^{\frac{3}{2}}}+\frac{x}{x^{\frac{5}{2}}+x^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2))/x**2,x)
```

```
[Out] -x**(5/2)*acot(sqrt(x))/(x**(5/2) + x**(3/2)) - 2*x**(3/2)*acot(sqrt(x))/(x
**(5/2) + x**(3/2)) - sqrt(x)*acot(sqrt(x))/(x**(5/2) + x**(3/2)) + x**2/(x
**(5/2) + x**(3/2)) + x/(x**(5/2) + x**(3/2))
```

Giac [A] time = 1.10118, size = 26, normalized size = 1.13

$$-\frac{\arctan\left(\frac{1}{\sqrt{x}}\right)}{x} + \frac{1}{\sqrt{x}} - \arctan\left(\frac{1}{\sqrt{x}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^2,x, algorithm="giac")
```

```
[Out] -arctan(1/sqrt(x))/x + 1/sqrt(x) - arctan(1/sqrt(x))
```

3.90 $\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x^3} \, dx$

Optimal. Leaf size=42

$$\frac{1}{6x^{3/2}} - \frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2} - \frac{1}{2\sqrt{x}} - \frac{1}{2}\tan^{-1}\left(\sqrt{x}\right)$$

```
[Out] 1/(6*x^(3/2)) - 1/(2*Sqrt[x]) - ArcCot[Sqrt[x]]/(2*x^2) - ArcTan[Sqrt[x]]/2
```

Rubi [A] time = 0.0122351, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5034, 51, 63, 203}

$$\frac{1}{6x^{3/2}} - \frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2} - \frac{1}{2\sqrt{x}} - \frac{1}{2}\tan^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]]/x^3,x]
```

```
[Out] 1/(6*x^(3/2)) - 1/(2*Sqrt[x]) - ArcCot[Sqrt[x]]/(2*x^2) - ArcTan[Sqrt[x]]/2
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x^3}\,dx &= -\frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2}-\frac{1}{4}\int \frac{1}{x^{5/2}(1+x)}\,dx\\
&= \frac{1}{6x^{3/2}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2}+\frac{1}{4}\int \frac{1}{x^{3/2}(1+x)}\,dx\\
&= \frac{1}{6x^{3/2}}-\frac{1}{2\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2}-\frac{1}{4}\int \frac{1}{\sqrt{x}(1+x)}\,dx\\
&= \frac{1}{6x^{3/2}}-\frac{1}{2\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2}-\frac{1}{2}\,\text{Subst}\left(\int \frac{1}{1+x^2}\,dx,x,\sqrt{x}\right)\\
&= \frac{1}{6x^{3/2}}-\frac{1}{2\sqrt{x}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2}-\frac{1}{2}\tan^{-1}\left(\sqrt{x}\right)
\end{aligned}$$

Mathematica [C] time = 0.0095162, size = 34, normalized size = 0.81

$$\frac{{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-x\right)}{6x^{3/2}}-\frac{\cot^{-1}\left(\sqrt{x}\right)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]]/x^3,x]
```

```
[Out] -ArcCot[Sqrt[x]]/(2*x^2) + Hypergeometric2F1[-3/2, 1, -1/2, -x]/(6*x^(3/2))
```

Maple [A] time = 0.029, size = 27, normalized size = 0.6

$$\frac{1}{6}x^{-\frac{3}{2}} - \frac{1}{2\,x^2}\mathrm{arccot}\left(\sqrt{x}\right) - \frac{1}{2}\arctan\left(\sqrt{x}\right) - \frac{1}{2}\frac{1}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2))/x^3,x)
```

```
[Out] 1/6/x^(3/2)-1/2*arccot(x^(1/2))/x^2-1/2*arctan(x^(1/2))-1/2/x^(1/2)
```

Maxima [A] time = 1.46271, size = 35, normalized size = 0.83

$$-\frac{3\,x-1}{6\,x^{\frac{3}{2}}} - \frac{\mathrm{arccot}\left(\sqrt{x}\right)}{2\,x^2} - \frac{1}{2}\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^3,x, algorithm="maxima")
```

```
[Out] -1/6*(3*x - 1)/x^(3/2) - 1/2*arccot(sqrt(x))/x^2 - 1/2*arctan(sqrt(x))
```

Fricas [A] time = 2.18785, size = 80, normalized size = 1.9

$$\frac{3\left(x^2-1\right)\mathrm{arccot}\left(\sqrt{x}\right) - (3\,x-1)\sqrt{x}}{6\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^3,x, algorithm="fricas")
```

```
[Out] 1/6*(3*(x^2 - 1)*arccot(sqrt(x)) - (3*x - 1)*sqrt(x))/x^2
```

Sympy [B] time = 8.74439, size = 160, normalized size = 3.81

$$\frac{3x^{\frac{7}{2}}\,\mathrm{acot}\left(\sqrt{x}\right)}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}} + \frac{3x^{\frac{5}{2}}\,\mathrm{acot}\left(\sqrt{x}\right)}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}} - \frac{3x^{\frac{3}{2}}\,\mathrm{acot}\left(\sqrt{x}\right)}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}} - \frac{3\sqrt{x}\,\mathrm{acot}\left(\sqrt{x}\right)}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}} - \frac{3x^3}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}} - \frac{2x^2}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}} + \frac{x}{6x^{\frac{7}{2}}+6x^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2))/x**3,x)
```

```
[Out] 3*x**(7/2)*acot(sqrt(x))/(6*x**(7/2) + 6*x**(5/2)) + 3*x**(5/2)*acot(sqrt(x
))/(6*x**(7/2) + 6*x**(5/2)) - 3*x**(3/2)*acot(sqrt(x))/(6*x**(7/2) + 6*x**
(5/2)) - 3*sqrt(x)*acot(sqrt(x))/(6*x**(7/2) + 6*x**(5/2)) - 3*x**3/(6*x**(
7/2) + 6*x**(5/2)) - 2*x**2/(6*x**(7/2) + 6*x**(5/2)) + x/(6*x**(7/2) + 6*x
**(5/2))
```

Giac [A] time = 1.1076, size = 35, normalized size = 0.83

$$-\frac{3\,x-1}{6\,x^{\frac{3}{2}}}-\frac{\arctan\left(\frac{1}{\sqrt{x}}\right)}{2\,x^2}-\frac{1}{2}\,\arctan\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^3,x, algorithm="giac")
```

```
[Out] -1/6*(3*x - 1)/x^(3/2) - 1/2*arctan(1/sqrt(x))/x^2 - 1/2*arctan(sqrt(x))
```

3.91 $\int x^{3/2} \cot^{-1}\left(\sqrt{x}\right) dx$

Optimal. Leaf size=36

$$\frac{x^2}{10} + \frac{2}{5}x^{5/2}\cot^{-1}\left(\sqrt{x}\right) - \frac{x}{5} + \frac{1}{5}\log(x+1)$$

```
[Out] -x/5 + x^2/10 + (2*x^(5/2)*ArcCot[Sqrt[x]])/5 + Log[1 + x]/5
```

Rubi [A] time = 0.0137792, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {5034, 43}

$$\frac{x^2}{10} + \frac{2}{5}x^{5/2}\cot^{-1}\left(\sqrt{x}\right) - \frac{x}{5} + \frac{1}{5}\log(x+1)$$

Antiderivative was successfully verified.

```
[In] Int[x^(3/2)*ArcCot[Sqrt[x]],x]
```

```
[Out] -x/5 + x^2/10 + (2*x^(5/2)*ArcCot[Sqrt[x]])/5 + Log[1 + x]/5
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int x^{3/2}\cot^{-1}\left(\sqrt{x}\right)dx &= \frac{2}{5}x^{5/2}\cot^{-1}\left(\sqrt{x}\right)+\frac{1}{5}\int\frac{x^2}{1+x}\,dx\\ &= \frac{2}{5}x^{5/2}\cot^{-1}\left(\sqrt{x}\right)+\frac{1}{5}\int\left(-1+x+\frac{1}{1+x}\right)dx\\ &= -\frac{x}{5}+\frac{x^2}{10}+\frac{2}{5}x^{5/2}\cot^{-1}\left(\sqrt{x}\right)+\frac{1}{5}\log(1+x)\end{aligned}$$

Mathematica [A] time = 0.0161584, size = 29, normalized size = 0.81

$$\frac{1}{10}\left(4x^{5/2}\cot^{-1}\left(\sqrt{x}\right)+(x-2)x+2\log(x+1)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(3/2)*ArcCot[Sqrt[x]],x]
```

```
[Out] ((-2 + x)*x + 4*x^(5/2)*ArcCot[Sqrt[x]] + 2*Log[1 + x])/10
```

Maple [A] time = 0.023, size = 25, normalized size = 0.7

$$-\frac{x}{5}+\frac{x^2}{10}+\frac{2}{5}x^{\frac{5}{2}}\mathrm{arccot}\left(\sqrt{x}\right)+\frac{\ln(x+1)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(3/2)*arccot(x^(1/2)),x)
```

```
[Out] -1/5*x+1/10*x^2+2/5*x^(5/2)*arccot(x^(1/2))+1/5*ln(x+1)
```

Maxima [A] time = 0.973942, size = 32, normalized size = 0.89

$$\frac{2}{5}x^{\frac{5}{2}}\,\mathrm{arccot}\left(\sqrt{x}\right)+\frac{1}{10}x^2-\frac{1}{5}x+\frac{1}{5}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(3/2)*arccot(x^(1/2)),x, algorithm="maxima")
```

```
[Out] 2/5*x^(5/2)*arccot(sqrt(x)) + 1/10*x^2 - 1/5*x + 1/5*log(x + 1)
```

Fricas [A] time = 2.20899, size = 88, normalized size = 2.44

$$\frac{2}{5}\,x^{\frac{5}{2}}\operatorname{arccot}\left(\sqrt{x}\right)+\frac{1}{10}\,x^{2}-\frac{1}{5}\,x+\frac{1}{5}\,\log\left(x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(3/2)*arccot(x^(1/2)),x, algorithm="fricas")
```

```
[Out] 2/5*x^(5/2)*arccot(sqrt(x)) + 1/10*x^2 - 1/5*x + 1/5*log(x + 1)
```

Sympy [B] time = 7.88749, size = 85, normalized size = 2.36

$$\frac{4x^{\frac{7}{2}}\operatorname{acot}\left(\sqrt{x}\right)}{10x+10}+\frac{4x^{\frac{5}{2}}\operatorname{acot}\left(\sqrt{x}\right)}{10x+10}+\frac{x^{3}}{10x+10}-\frac{x^{2}}{10x+10}+\frac{2x\log\left(x+1\right)}{10x+10}+\frac{2\log\left(x+1\right)}{10x+10}+\frac{2}{10x+10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(3/2)*acot(x**(1/2)),x)
```

```
[Out] 4*x**(7/2)*acot(sqrt(x))/(10*x + 10) + 4*x**(5/2)*acot(sqrt(x))/(10*x + 10)
 + x**3/(10*x + 10) - x**2/(10*x + 10) + 2*x*log(x + 1)/(10*x + 10) + 2*log
(x + 1)/(10*x + 10) + 2/(10*x + 10)
```

Giac [A] time = 1.09629, size = 32, normalized size = 0.89

$$\frac{2}{5}\,x^{\frac{5}{2}}\arctan\left(\frac{1}{\sqrt{x}}\right)+\frac{1}{10}\,x^{2}-\frac{1}{5}\,x+\frac{1}{5}\,\log\left(x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(3/2)*arccot(x^(1/2)),x, algorithm="giac")
```

```
[Out] 2/5*x^(5/2)*arctan(1/sqrt(x)) + 1/10*x^2 - 1/5*x + 1/5*log(x + 1)
```

3.92 $\int \sqrt{x}\cot^{-1}\left(\sqrt{x}\right)\,dx$

Optimal. Leaf size=29

$$\frac{2}{3}x^{3/2}\cot^{-1}\left(\sqrt{x}\right)+\frac{x}{3}-\frac{1}{3}\log(x+1)$$

```
[Out] x/3 + (2*x^(3/2)*ArcCot[Sqrt[x]])/3 - Log[1 + x]/3
```

Rubi [A] time = 0.0105779, antiderivative size = 29, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {5034, 43}

$$\frac{2}{3}x^{3/2}\cot^{-1}\left(\sqrt{x}\right)+\frac{x}{3}-\frac{1}{3}\log(x+1)$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[x]*ArcCot[Sqrt[x]],x]
```

```
[Out] x/3 + (2*x^(3/2)*ArcCot[Sqrt[x]])/3 - Log[1 + x]/3
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \sqrt{x}\cot^{-1}\left(\sqrt{x}\right)dx = \frac{2}{3}x^{3/2}\cot^{-1}\left(\sqrt{x}\right) + \frac{1}{3}\int \frac{x}{1+x}dx$$
$$= \frac{2}{3}x^{3/2}\cot^{-1}\left(\sqrt{x}\right) + \frac{1}{3}\int \left(1 + \frac{1}{-1-x}\right)dx$$
$$= \frac{x}{3} + \frac{2}{3}x^{3/2}\cot^{-1}\left(\sqrt{x}\right) - \frac{1}{3}\log(1+x)$$

Mathematica [A] time = 0.0108016, size = 25, normalized size = 0.86

$$\frac{1}{3}\left(2x^{3/2}\cot^{-1}\left(\sqrt{x}\right) + x - \log(x+1)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[x]*ArcCot[Sqrt[x]],x]
```

```
[Out] (x + 2*x^(3/2)*ArcCot[Sqrt[x]] - Log[1 + x])/3
```

Maple [A] time = 0.023, size = 20, normalized size = 0.7

$$\frac{x}{3} + \frac{2}{3}x^{\frac{3}{2}}\mathrm{arccot}\left(\sqrt{x}\right) - \frac{\ln(x+1)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(1/2)*arccot(x^(1/2)),x)
```

```
[Out] 1/3*x+2/3*x^(3/2)*arccot(x^(1/2))-1/3*ln(x+1)
```

Maxima [A] time = 0.973025, size = 26, normalized size = 0.9

$$\frac{2}{3}x^{\frac{3}{2}}\,\mathrm{arccot}\left(\sqrt{x}\right) + \frac{1}{3}x - \frac{1}{3}\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(1/2)*arccot(x^(1/2)),x, algorithm="maxima")
```

```
[Out] 2/3*x^(3/2)*arccot(sqrt(x)) + 1/3*x - 1/3*log(x + 1)
```

Fricas [A] time = 2.18903, size = 73, normalized size = 2.52

$$\frac{2}{3}x^{\frac{3}{2}}\operatorname{arccot}\left(\sqrt{x}\right)+\frac{1}{3}x-\frac{1}{3}\log\left(x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(1/2)*arccot(x^(1/2)),x, algorithm="fricas")
```

```
[Out] 2/3*x^(3/2)*arccot(sqrt(x)) + 1/3*x - 1/3*log(x + 1)
```

Sympy [A] time = 1.33226, size = 24, normalized size = 0.83

$$\frac{2x^{\frac{3}{2}}\operatorname{acot}\left(\sqrt{x}\right)}{3}+\frac{x}{3}-\frac{\log\left(x+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(1/2)*acot(x**(1/2)),x)
```

```
[Out] 2*x**(3/2)*acot(sqrt(x))/3 + x/3 - log(x + 1)/3
```

Giac [A] time = 1.10654, size = 26, normalized size = 0.9

$$\frac{2}{3}x^{\frac{3}{2}}\arctan\left(\frac{1}{\sqrt{x}}\right)+\frac{1}{3}x-\frac{1}{3}\log\left(x+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(1/2)*arccot(x^(1/2)),x, algorithm="giac")
```

```
[Out] 2/3*x^(3/2)*arctan(1/sqrt(x)) + 1/3*x - 1/3*log(x + 1)
```

3.93 $\int \frac{\cot^{-1}(\sqrt{x})}{\sqrt{x}}\, dx$

Optimal. Leaf size=18

$$\log(x+1)+2\sqrt{x}\cot^{-1}\left(\sqrt{x}\right)$$

```
[Out] 2*Sqrt[x]*ArcCot[Sqrt[x]] + Log[1 + x]
```

Rubi [A] time = 0.0068054, antiderivative size = 18, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {5034, 31}

$$\log(x+1)+2\sqrt{x}\cot^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]]/Sqrt[x],x]
```

```
[Out] 2*Sqrt[x]*ArcCot[Sqrt[x]] + Log[1 + x]
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}}\, dx &= 2\sqrt{x}\cot^{-1}\left(\sqrt{x}\right)+\int \frac{1}{1+x}\, dx\\ &= 2\sqrt{x}\cot^{-1}\left(\sqrt{x}\right)+\log(1+x)\end{aligned}$$

Mathematica [A] time = 0.0068556, size = 18, normalized size = 1.

$$\log(x+1)+2\sqrt{x}\cot^{-1}\left(\sqrt{x}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]]/Sqrt[x],x]
```

```
[Out] 2*Sqrt[x]*ArcCot[Sqrt[x]] + Log[1 + x]
```

Maple [A] time = 0.023, size = 15, normalized size = 0.8

$$\ln(x+1)+2\sqrt{x}\operatorname{arccot}\left(\sqrt{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2))/x^(1/2),x)
```

```
[Out] ln(x+1)+2*x^(1/2)*arccot(x^(1/2))
```

Maxima [A] time = 0.955033, size = 19, normalized size = 1.06

$$2\sqrt{x}\operatorname{arccot}\left(\sqrt{x}\right)+\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(1/2),x, algorithm="maxima")
```

```
[Out] 2*sqrt(x)*arccot(sqrt(x)) + log(x + 1)
```

Fricas [A] time = 2.20801, size = 54, normalized size = 3.

$$2\sqrt{x}\operatorname{arccot}\left(\sqrt{x}\right)+\log(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(1/2),x, algorithm="fricas")
```

```
[Out] 2*sqrt(x)*arccot(sqrt(x)) + log(x + 1)
```

Sympy [A] time = 0.449524, size = 17, normalized size = 0.94

$$2\sqrt{x}\operatorname{acot}\left(\sqrt{x}\right) + \log\left(x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2))/x**(1/2),x)
```

```
[Out] 2*sqrt(x)*acot(sqrt(x)) + log(x + 1)
```

Giac [A] time = 1.09288, size = 19, normalized size = 1.06

$$2\sqrt{x}\arctan\left(\frac{1}{\sqrt{x}}\right) + \log\left(x + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(1/2),x, algorithm="giac")
```

```
[Out] 2*sqrt(x)*arctan(1/sqrt(x)) + log(x + 1)
```

3.94 $\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x^{3/2}}\,dx$

Optimal. Leaf size=22

$$-\log(x)+\log(x+1)-\frac{2\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}}$$

```
[Out] (-2*ArcCot[Sqrt[x]])/Sqrt[x] - Log[x] + Log[1 + x]
```

Rubi [A] time = 0.0076322, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5034, 36, 29, 31}

$$-\log(x)+\log(x+1)-\frac{2\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]]/x^(3/2),x]
```

```
[Out] (-2*ArcCot[Sqrt[x]])/Sqrt[x] - Log[x] + Log[1 + x]
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x^{3/2}}\,dx &= -\frac{2\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}} - \int \frac{1}{x(1+x)}\,dx \\
&= -\frac{2\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}} - \int \frac{1}{x}\,dx + \int \frac{1}{1+x}\,dx \\
&= -\frac{2\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}} - \log(x) + \log(1+x)
\end{aligned}$$

Mathematica [A] time = 0.0118346, size = 22, normalized size = 1.

$$-\log(x) + \log(x+1) - \frac{2\cot^{-1}\left(\sqrt{x}\right)}{\sqrt{x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]]/x^(3/2),x]
```

```
[Out] (-2*ArcCot[Sqrt[x]])/Sqrt[x] - Log[x] + Log[1 + x]
```

Maple [A] time = 0.027, size = 19, normalized size = 0.9

$$-\ln(x) + \ln(x+1) - 2\,\frac{\operatorname{arccot}\left(\sqrt{x}\right)}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2))/x^(3/2),x)
```

```
[Out] -ln(x)+ln(x+1)-2*arccot(x^(1/2))/x^(1/2)
```

Maxima [A] time = 0.978603, size = 24, normalized size = 1.09

$$-\frac{2\,\operatorname{arccot}\left(\sqrt{x}\right)}{\sqrt{x}} + \log\left(x+1\right) - \log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(3/2),x, algorithm="maxima")
```

```
[Out] -2*arccot(sqrt(x))/sqrt(x) + log(x + 1) - log(x)
```

Fricas [A] time = 2.13551, size = 77, normalized size = 3.5

$$\frac{x\log\left(x+1\right) - x\log\left(x\right) - 2\,\sqrt{x}\operatorname{arccot}\left(\sqrt{x}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(3/2),x, algorithm="fricas")
```

```
[Out] (x*log(x + 1) - x*log(x) - 2*sqrt(x)*arccot(sqrt(x)))/x
```

Sympy [A] time = 1.76621, size = 20, normalized size = 0.91

$$-\log\left(x\right) + \log\left(x+1\right) - \frac{2\operatorname{acot}\left(\sqrt{x}\right)}{\sqrt{x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2))/x**(3/2),x)
```

```
[Out] -log(x) + log(x + 1) - 2*acot(sqrt(x))/sqrt(x)
```

Giac [A] time = 1.12818, size = 22, normalized size = 1.

$$-\frac{2\,\arctan\left(\frac{1}{\sqrt{x}}\right)}{\sqrt{x}} + \log\left(\frac{1}{x}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(3/2),x, algorithm="giac")
```

```
[Out] -2*arctan(1/sqrt(x))/sqrt(x) + log(1/x + 1)
```

3.95 $\int \frac{\cot^{-1}(\sqrt{x})}{x^{5/2}}\, dx$

Optimal. Leaf size=37

$$-\frac{2\cot^{-1}\left(\sqrt{x}\right)}{3x^{3/2}}+\frac{1}{3x}+\frac{\log(x)}{3}-\frac{1}{3}\log(x+1)$$

```
[Out] 1/(3*x) - (2*ArcCot[Sqrt[x]])/(3*x^(3/2)) + Log[x]/3 - Log[1 + x]/3
```

Rubi [A] time = 0.0120186, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {5034, 44}

$$-\frac{2\cot^{-1}\left(\sqrt{x}\right)}{3x^{3/2}}+\frac{1}{3x}+\frac{\log(x)}{3}-\frac{1}{3}\log(x+1)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Sqrt[x]]/x^(5/2),x]
```

```
[Out] 1/(3*x) - (2*ArcCot[Sqrt[x]])/(3*x^(3/2)) + Log[x]/3 - Log[1 + x]/3
```

Rule 5034

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :
> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x^n]))/(d*(m + 1)), x] + Dist[(b*c*n)
/(d*(m + 1)), Int[(x^(n - 1)*(d*x)^(m + 1))/(1 + c^2*x^(2*n)), x], x] /; Fr
eeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{\cot^{-1}\left(\sqrt{x}\right)}{x^{5/2}}\,dx = -\frac{2\cot^{-1}\left(\sqrt{x}\right)}{3x^{3/2}} - \frac{1}{3}\int \frac{1}{x^2(1+x)}\,dx$$
$$= -\frac{2\cot^{-1}\left(\sqrt{x}\right)}{3x^{3/2}} - \frac{1}{3}\int \left(\frac{1}{x^2} - \frac{1}{x} + \frac{1}{1+x}\right)dx$$
$$= \frac{1}{3x} - \frac{2\cot^{-1}\left(\sqrt{x}\right)}{3x^{3/2}} + \frac{\log(x)}{3} - \frac{1}{3}\log(1+x)$$

Mathematica [A] time = 0.018484, size = 29, normalized size = 0.78

$$\frac{1}{3}\left(-\frac{2\cot^{-1}\left(\sqrt{x}\right)}{x^{3/2}} + \frac{1}{x} + \log(x) - \log(x+1)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Sqrt[x]]/x^(5/2),x]
```

```
[Out] (x^(-1) - (2*ArcCot[Sqrt[x]])/x^(3/2) + Log[x] - Log[1 + x])/3
```

Maple [A] time = 0.029, size = 26, normalized size = 0.7

$$\frac{1}{3\,x} - \frac{2}{3}\mathrm{arccot}\left(\sqrt{x}\right)x^{-\frac{3}{2}} + \frac{\ln(x)}{3} - \frac{\ln(x+1)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x^(1/2))/x^(5/2),x)
```

```
[Out] 1/3/x-2/3*arccot(x^(1/2))/x^(3/2)+1/3*ln(x)-1/3*ln(x+1)
```

Maxima [A] time = 1.00591, size = 34, normalized size = 0.92

$$-\frac{2\,\mathrm{arccot}\left(\sqrt{x}\right)}{3\,x^{\frac{3}{2}}} + \frac{1}{3\,x} - \frac{1}{3}\,\log\left(x+1\right) + \frac{1}{3}\,\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(5/2),x, algorithm="maxima")
```

```
[Out] -2/3*arccot(sqrt(x))/x^(3/2) + 1/3/x - 1/3*log(x + 1) + 1/3*log(x)
```

Fricas [A] time = 2.26169, size = 97, normalized size = 2.62

$$-\frac{x^2\log(x+1)-x^2\log(x)+2\sqrt{x}\operatorname{arccot}\left(\sqrt{x}\right)-x}{3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(5/2),x, algorithm="fricas")
```

```
[Out] -1/3*(x^2*log(x + 1) - x^2*log(x) + 2*sqrt(x)*arccot(sqrt(x)) - x)/x^2
```

Sympy [B] time = 8.51655, size = 143, normalized size = 3.86

$$-\frac{2x^{\frac{3}{2}}\operatorname{acot}\left(\sqrt{x}\right)}{3x^3+3x^2}-\frac{2\sqrt{x}\operatorname{acot}\left(\sqrt{x}\right)}{3x^3+3x^2}+\frac{x^3\log(x)}{3x^3+3x^2}-\frac{x^3\log(x+1)}{3x^3+3x^2}-\frac{x^3}{3x^3+3x^2}+\frac{x^2\log(x)}{3x^3+3x^2}-\frac{x^2\log(x+1)}{3x^3+3x^2}+\frac{x}{3x^3+3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(x**(1/2))/x**(5/2),x)
```

```
[Out] -2*x**(3/2)*acot(sqrt(x))/(3*x**3 + 3*x**2) - 2*sqrt(x)*acot(sqrt(x))/(3*x*
*3 + 3*x**2) + x**3*log(x)/(3*x**3 + 3*x**2) - x**3*log(x + 1)/(3*x**3 + 3*
x**2) - x**3/(3*x**3 + 3*x**2) + x**2*log(x)/(3*x**3 + 3*x**2) - x**2*log(x
 + 1)/(3*x**3 + 3*x**2) + x/(3*x**3 + 3*x**2)
```

Giac [A] time = 1.12866, size = 38, normalized size = 1.03

$$-\frac{x-1}{3x}-\frac{2\arctan\left(\frac{1}{\sqrt{x}}\right)}{3x^{\frac{3}{2}}}-\frac{1}{3}\log(x+1)+\frac{1}{3}\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(x^(1/2))/x^(5/2),x, algorithm="giac")
```

```
[Out] -1/3*(x - 1)/x - 2/3*arctan(1/sqrt(x))/x^(3/2) - 1/3*log(x + 1) + 1/3*log(x
)
```

3.96 $\int \cot^{-1}\left(\frac{1}{x}\right) dx$

Optimal. Leaf size=17

$$x\cot^{-1}\left(\frac{1}{x}\right) - \frac{1}{2}\log\left(x^2+1\right)$$

```
[Out] x*ArcCot[x^(-1)] - Log[1 + x^2]/2
```

Rubi [A] time = 0.005577, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.75, Rules used = {5028, 263, 260}

$$x\cot^{-1}\left(\frac{1}{x}\right) - \frac{1}{2}\log\left(x^2+1\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[x^(-1)],x]
```

```
[Out] x*ArcCot[x^(-1)] - Log[1 + x^2]/2
```

Rule 5028

```
Int[ArcCot[(c_.)*(x_)^(n_)], x_Symbol] :> Simp[x*ArcCot[c*x^n], x] + Dist[c
*n, Int[x^n/(1 + c^2*x^(2*n)), x], x] /; FreeQ[{c, n}, x]
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \cot^{-1}\left(\frac{1}{x}\right) dx = x\cot^{-1}\left(\frac{1}{x}\right) - \int \frac{1}{\left(1+\frac{1}{x^2}\right)x}\,dx$$
$$= x\cot^{-1}\left(\frac{1}{x}\right) - \int \frac{x}{1+x^2}\,dx$$
$$= x\cot^{-1}\left(\frac{1}{x}\right) - \frac{1}{2}\log\left(1+x^2\right)$$

Mathematica [A] time = 0.0015833, size = 17, normalized size = 1.

$$x\cot^{-1}\left(\frac{1}{x}\right) - \frac{1}{2}\log\left(x^2+1\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[x^(-1)],x]
```

```
[Out] x*ArcCot[x^(-1)] - Log[1 + x^2]/2
```

Maple [A] time = 0.049, size = 20, normalized size = 1.2

$$x\mathrm{arccot}\left(x^{-1}\right) - \frac{\ln\left(x^{-2}+1\right)}{2} + \ln\left(x^{-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(1/x),x)
```

```
[Out] x*arccot(1/x)-1/2*ln(1/x^2+1)+ln(1/x)
```

Maxima [A] time = 0.992027, size = 20, normalized size = 1.18

$$x\,\mathrm{arccot}\left(\frac{1}{x}\right) - \frac{1}{2}\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(1/x),x, algorithm="maxima")
```

```
[Out] x*arccot(1/x) - 1/2*log(x^2 + 1)
```

Fricas [A] time = 2.07521, size = 46, normalized size = 2.71

$$x \operatorname{arccot}\left(\frac{1}{x}\right) - \frac{1}{2} \log\left(x^2 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(1/x),x, algorithm="fricas")
```

```
[Out] x*arccot(1/x) - 1/2*log(x^2 + 1)
```

Sympy [A] time = 0.191395, size = 14, normalized size = 0.82

$$x \operatorname{acot}\left(\frac{1}{x}\right) - \frac{\log\left(x^2 + 1\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(1/x),x)
```

```
[Out] x*acot(1/x) - log(x**2 + 1)/2
```

Giac [A] time = 1.09883, size = 18, normalized size = 1.06

$$x \arctan(x) - \frac{1}{2} \log\left(x^2 + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(1/x),x, algorithm="giac")
```

```
[Out] x*arctan(x) - 1/2*log(x^2 + 1)
```

3.97 $\int \frac{\cot^{-1}(ax^n)}{x}\,dx$

Optimal. Leaf size=47

$$\frac{i\text{PolyLog}\left(2,\frac{ix^{-n}}{a}\right)}{2n}-\frac{i\text{PolyLog}\left(2,-\frac{ix^{-n}}{a}\right)}{2n}$$

```
[Out] ((-I/2)*PolyLog[2, (-I)/(a*x^n)])/n + ((I/2)*PolyLog[2, I/(a*x^n)])/n
```

Rubi [A] time = 0.0351754, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5032, 4849, 2391}

$$\frac{i\text{PolyLog}\left(2,\frac{ix^{-n}}{a}\right)}{2n}-\frac{i\text{PolyLog}\left(2,-\frac{ix^{-n}}{a}\right)}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^n]/x,x]
```

```
[Out] ((-I/2)*PolyLog[2, (-I)/(a*x^n)])/n + ((I/2)*PolyLog[2, I/(a*x^n)])/n
```

Rule 5032

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1
/n, Subst[Int[(a + b*ArcCot[c*x])^p/x, x], x, x^n], x] /; FreeQ[{a, b, c, n
}, x] && IGtQ[p, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax^n)}{x}\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(ax)}{x}\,dx, x, x^n\right)}{n}$$
$$= \frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{ax}\right)}{x}\,dx, x, x^n\right)}{2n} - \frac{i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{ax}\right)}{x}\,dx, x, x^n\right)}{2n}$$
$$= -\frac{i\text{Li}_2\left(-\frac{ix^{-n}}{a}\right)}{2n} + \frac{i\text{Li}_2\left(\frac{ix^{-n}}{a}\right)}{2n}$$

Mathematica [A] time = 0.0150394, size = 40, normalized size = 0.85

$$-\frac{i\left(\text{PolyLog}\left(2,-\frac{ix^{-n}}{a}\right)-\text{PolyLog}\left(2,\frac{ix^{-n}}{a}\right)\right)}{2n}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^n]/x,x]
```

```
[Out] ((-I/2)*(PolyLog[2, (-I)/(a*x^n)] - PolyLog[2, I/(a*x^n)]))/n
```

Maple [B] time = 0.052, size = 94, normalized size = 2.

$$\frac{\ln(ax^n)\,\text{arccot}(ax^n)}{n} - \frac{\frac{i}{2}\ln(ax^n)\ln(1+iax^n)}{n} + \frac{\frac{i}{2}\ln(ax^n)\ln(1-iax^n)}{n} - \frac{\frac{i}{2}\text{dilog}(1+iax^n)}{n} + \frac{\frac{i}{2}\text{dilog}(1-iax^n)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^n)/x,x)
```

```
[Out] 1/n*ln(a*x^n)*arccot(a*x^n)-1/2*I/n*ln(a*x^n)*ln(1+I*a*x^n)+1/2*I/n*ln(a*x^
n)*ln(1-I*a*x^n)-1/2*I/n*dilog(1+I*a*x^n)+1/2*I/n*dilog(1-I*a*x^n)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$an\int \frac{x^n\log(x)}{a^2xx^{2n}+x}\,dx + \arctan(1, ax^n)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^n)/x,x, algorithm="maxima")
```

```
[Out] a*n*integrate(x^n*log(x)/(a^2*x*x^(2*n) + x), x) + arctan2(1, a*x^n)*log(x)
```

Fricas [A] time = 2.32139, size = 181, normalized size = 3.85

$$\frac{2\,n\,\mathrm{arccot}\left(ax^{n}\right)\log\left(x\right)-i\,n\log\left(i\,ax^{n}+1\right)\log\left(x\right)+i\,n\log\left(-i\,ax^{n}+1\right)\log\left(x\right)+i\,\mathrm{Li}_2\left(i\,ax^{n}\right)-i\,\mathrm{Li}_2\left(-i\,ax^{n}\right)}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^n)/x,x, algorithm="fricas")
```

```
[Out] 1/2*(2*n*arccot(a*x^n)*log(x) - I*n*log(I*a*x^n + 1)*log(x) + I*n*log(-I*a*
x^n + 1)*log(x) + I*dilog(I*a*x^n) - I*dilog(-I*a*x^n))/n
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\mathrm{acot}\left(ax^{n}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**n)/x,x)
```

```
[Out] Integral(acot(a*x**n)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\mathrm{arccot}\left(ax^{n}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^n)/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x^n)/x, x)
```

3.98 $\int \frac{\cot^{-1}(ax^5)}{x} \, dx$

Optimal. Leaf size=37

$$\frac{1}{10} i \text{PolyLog}\left(2, \frac{i}{ax^5}\right) - \frac{1}{10} i \text{PolyLog}\left(2, -\frac{i}{ax^5}\right)$$

```
[Out] (-I/10)*PolyLog[2, (-I)/(a*x^5)] + (I/10)*PolyLog[2, I/(a*x^5)]
```

Rubi [A] time = 0.0344804, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5032, 4849, 2391}

$$\frac{1}{10} i \text{PolyLog}\left(2, \frac{i}{ax^5}\right) - \frac{1}{10} i \text{PolyLog}\left(2, -\frac{i}{ax^5}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a*x^5]/x,x]
```

```
[Out] (-I/10)*PolyLog[2, (-I)/(a*x^5)] + (I/10)*PolyLog[2, I/(a*x^5)]
```

Rule 5032

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1
/n, Subst[Int[(a + b*ArcCot[c*x])^p/x, x], x, x^n], x] /; FreeQ[{a, b, c, n
}, x] && IGtQ[p, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(ax^5)}{x}\,dx = \frac{1}{5}\,\text{Subst}\left(\int \frac{\cot^{-1}(ax)}{x}\,dx, x, x^5\right)$$
$$= \frac{1}{10} i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{ax}\right)}{x}\,dx, x, x^5\right) - \frac{1}{10} i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{ax}\right)}{x}\,dx, x, x^5\right)$$
$$= -\frac{1}{10} i \text{Li}_2\left(-\frac{i}{ax^5}\right) + \frac{1}{10} i \text{Li}_2\left(\frac{i}{ax^5}\right)$$

Mathematica [A] time = 0.0069422, size = 37, normalized size = 1.

$$\frac{1}{10} i \text{PolyLog}\left(2, \frac{i}{ax^5}\right) - \frac{1}{10} i \text{PolyLog}\left(2, -\frac{i}{ax^5}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a*x^5]/x,x]
```

```
[Out] (-I/10)*PolyLog[2, (-I)/(a*x^5)] + (I/10)*PolyLog[2, I/(a*x^5)]
```

Maple [C] time = 0.116, size = 57, normalized size = 1.5

$$\ln(x)\,\text{arccot}\left(ax^5\right) + \frac{1}{2a} \sum_{\_R1=\text{RootOf}\left(\_Z^{10}a^2+1\right)} \frac{1}{\_R1^5}\left(\ln(x)\ln\left(\frac{\_R1-x}{\_R1}\right) + \text{dilog}\left(\frac{\_R1-x}{\_R1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a*x^5)/x,x)
```

```
[Out] ln(x)*arccot(a*x^5)+1/2/a*sum(1/_R1^5*(ln(x)*ln((_R1-x)/_R1)+dilog((_R1-x)/
_R1)),_R1=RootOf(_Z^10*a^2+1))
```

Maxima [B] time = 1.62922, size = 108, normalized size = 2.92

$$-\frac{1}{5} i \arctan\left(ax^5\right) \arctan(0, a) + \frac{1}{20}\pi \log\left(a^2x^{10}+1\right) - \frac{1}{5}\arctan\left(ax^5\right)\log\left(x^5|a|\right) + \text{arccot}\left(ax^5\right)\log(x) + \arctan\left(ax^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^5)/x,x, algorithm="maxima")
```

```
[Out] -1/5*I*arctan(a*x^5)*arctan2(0, a) + 1/20*pi*log(a^2*x^10 + 1) - 1/5*arctan
(a*x^5)*log(x^5*abs(a)) + arccot(a*x^5)*log(x) + arctan(a*x^5)*log(x) + 1/1
0*I*dilog(I*a*x^5 + 1) - 1/10*I*dilog(-I*a*x^5 + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}\left(ax^5\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^5)/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(a*x^5)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a*x**5)/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(ax^5\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a*x^5)/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(a*x^5)/x, x)
```

3.99 $\int x^3 \cot^{-1}(a+bx)\,dx$

Optimal. Leaf size=106

$$-\frac{(1-6a^2)x}{4b^3}+\frac{a(1-a^2)\log((a+bx)^2+1)}{2b^4}+\frac{(a^4-6a^2+1)\tan^{-1}(a+bx)}{4b^4}+\frac{(a+bx)^3}{12b^4}-\frac{a(a+bx)^2}{2b^4}+\frac{1}{4}x^4\cot^{-1}(a+$$

```
[Out] -((1 - 6*a^2)*x)/(4*b^3) - (a*(a + b*x)^2)/(2*b^4) + (a + b*x)^3/(12*b^4) +
 (x^4*ArcCot[a + b*x])/4 + ((1 - 6*a^2 + a^4)*ArcTan[a + b*x])/(4*b^4) + (a
*(1 - a^2)*Log[1 + (a + b*x)^2])/(2*b^4)
```

Rubi [A] time = 0.107426, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {5048, 4863, 702, 635, 203, 260}

$$-\frac{(1-6a^2)x}{4b^3}+\frac{a(1-a^2)\log((a+bx)^2+1)}{2b^4}+\frac{(a^4-6a^2+1)\tan^{-1}(a+bx)}{4b^4}+\frac{(a+bx)^3}{12b^4}-\frac{a(a+bx)^2}{2b^4}+\frac{1}{4}x^4\cot^{-1}(a+$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcCot[a + b*x],x]
```

```
[Out] -((1 - 6*a^2)*x)/(4*b^3) - (a*(a + b*x)^2)/(2*b^4) + (a + b*x)^3/(12*b^4) +
 (x^4*ArcCot[a + b*x])/4 + ((1 - 6*a^2 + a^4)*ArcTan[a + b*x])/(4*b^4) + (a
*(1 - a^2)*Log[1 + (a + b*x)^2])/(2*b^4)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 702

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Polyno
mialDivide[(d + e*x)^m, a + c*x^2, x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[
c*d^2 + a*e^2, 0] && IGtQ[m, 1] && (NeQ[d, 0] || GtQ[m, 2])
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int x^3 \cot^{-1}(a+bx)\,dx = \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^3 \cot^{-1}(x)\,dx, x, a+bx\right)}{b}$$

$$= \frac{1}{4}x^4\cot^{-1}(a+bx) + \frac{1}{4}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^4}{1+x^2}\,dx, x, a+bx\right)$$

$$= \frac{1}{4}x^4\cot^{-1}(a+bx) + \frac{1}{4}\text{Subst}\left(\int \left(-\frac{1-6a^2}{b^4} - \frac{4ax}{b^4} + \frac{x^2}{b^4} + \frac{1-6a^2+a^4+4a\left(1-a^2\right)x}{b^4\left(1+x^2\right)}\right) dx, x, a$$

$$= -\frac{\left(1-6a^2\right)x}{4b^3} - \frac{a(a+bx)^2}{2b^4} + \frac{(a+bx)^3}{12b^4} + \frac{1}{4}x^4\cot^{-1}(a+bx) + \frac{\text{Subst}\left(\int \frac{1-6a^2+a^4+4a\left(1-a^2\right)x}{1+x^2}\,dx, x,\right.}{4b^4}$$

$$= -\frac{\left(1-6a^2\right)x}{4b^3} - \frac{a(a+bx)^2}{2b^4} + \frac{(a+bx)^3}{12b^4} + \frac{1}{4}x^4\cot^{-1}(a+bx) + \frac{\left(a\left(1-a^2\right)\right)\text{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a\right.}{b^4}$$

$$= -\frac{\left(1-6a^2\right)x}{4b^3} - \frac{a(a+bx)^2}{2b^4} + \frac{(a+bx)^3}{12b^4} + \frac{1}{4}x^4\cot^{-1}(a+bx) + \frac{\left(1-6a^2+a^4\right)\tan^{-1}(a+bx)}{4b^4} + \frac{a}{-}$$

Mathematica [C] time = 0.066809, size = 95, normalized size = 0.9

$$\frac{6\left(6a^2-1\right)bx+6b^4x^4\cot^{-1}(a+bx)+2(a+bx)^3-12a(a+bx)^2-3i(a-i)^4\log(-a-bx+i)+3i(a+i)^4\log(a+bx+i}{24b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*ArcCot[a + b*x],x]
```

```
[Out] (6*(-1 + 6*a^2)*b*x - 12*a*(a + b*x)^2 + 2*(a + b*x)^3 + 6*b^4*x^4*ArcCot[a
 + b*x] - (3*I)*(-I + a)^4*Log[I - a - b*x] + (3*I)*(I + a)^4*Log[I + a + b
*x])/(24*b^4)
```

Maple [A] time = 0.052, size = 132, normalized size = 1.3

$$-\frac{a}{4\,b^4}-\frac{x}{4\,b^3}+\frac{13\,a^3}{12\,b^4}+\frac{x^4\mathrm{arccot}\,(bx+a)}{4}-\frac{ax^2}{4\,b^2}+\frac{3\,a^2x}{4\,b^3}+\frac{x^3}{12\,b}+\frac{\arctan\,(bx+a)}{4\,b^4}-\frac{\ln\left(1+(bx+a)^2\right)a^3}{2\,b^4}+\frac{\ln\left(1+(b\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(b*x+a),x)
```

```
[Out] -1/4/b^4*a-1/4/b^3*x+13/12/b^4*a^3+1/4*x^4*arccot(b*x+a)-1/4/b^2*x^2*a+3/4/
b^3*x*a^2+1/12/b*x^3+1/4/b^4*arctan(b*x+a)-1/2/b^4*ln(1+(b*x+a)^2)*a^3+1/2/
b^4*ln(1+(b*x+a)^2)*a+1/4/b^4*arctan(b*x+a)*a^4-3/2/b^4*arctan(b*x+a)*a^2
```

Maxima [A] time = 1.44549, size = 140, normalized size = 1.32

$$\frac{1}{4}\,x^4\,\mathrm{arccot}\,(bx+a)+\frac{1}{12}\,b\left(\frac{b^2x^3-3\,abx^2+3\left(3\,a^2-1\right)x}{b^4}+\frac{3\left(a^4-6\,a^2+1\right)\arctan\left(\frac{b^2x+ab}{b}\right)}{b^5}-\frac{6\left(a^3-a\right)\log\left(b^2x^2+2\right.}{b^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/4*x^4*arccot(b*x + a) + 1/12*b*((b^2*x^3 - 3*a*b*x^2 + 3*(3*a^2 - 1)*x)/b
^4 + 3*(a^4 - 6*a^2 + 1)*arctan((b^2*x + a*b)/b)/b^5 - 6*(a^3 - a)*log(b^2*
```

```
x^2 + 2*a*b*x + a^2 + 1)/b^5)
```

Fricas [A] time = 2.22711, size = 225, normalized size = 2.12

$$\frac{3\,b^4x^4\,\mathrm{arccot}\,(bx+a)+b^3x^3-3\,ab^2x^2+3\left(3\,a^2-1\right)bx+3\left(a^4-6\,a^2+1\right)\arctan\,(bx+a)-6\left(a^3-a\right)\log\left(b^2x^2+2\,abx\right.}{12\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/12*(3*b^4*x^4*arccot(b*x + a) + b^3*x^3 - 3*a*b^2*x^2 + 3*(3*a^2 - 1)*b*x
 + 3*(a^4 - 6*a^2 + 1)*arctan(b*x + a) - 6*(a^3 - a)*log(b^2*x^2 + 2*a*b*x
+ a^2 + 1))/b^4
```

Sympy [A] time = 4.02526, size = 155, normalized size = 1.46

$$\begin{cases} -\frac{a^4\,\mathrm{acot}\,(a+bx)}{4b^4}-\frac{a^3\log\left(a^2+2abx+b^2x^2+1\right)}{2b^4}+\frac{3a^2x}{4b^3}+\frac{3a^2\,\mathrm{acot}\,(a+bx)}{2b^4}-\frac{ax^2}{4b^2}+\frac{a\log\left(a^2+2abx+b^2x^2+1\right)}{2b^4}+\frac{x^4\,\mathrm{acot}\,(a+bx)}{4}+\frac{x^3}{12b}-\frac{x}{4b^3}-\frac{\mathrm{acot}\,(}{4b} \\ \frac{x^4\,\mathrm{acot}\,(a)}{4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(b*x+a),x)
```

```
[Out] Piecewise((-a**4*acot(a + b*x)/(4*b**4) - a**3*log(a**2 + 2*a*b*x + b**2*x*
*2 + 1)/(2*b**4) + 3*a**2*x/(4*b**3) + 3*a**2*acot(a + b*x)/(2*b**4) - a*x*
*2/(4*b**2) + a*log(a**2 + 2*a*b*x + b**2*x**2 + 1)/(2*b**4) + x**4*acot(a
+ b*x)/4 + x**3/(12*b) - x/(4*b**3) - acot(a + b*x)/(4*b**4), Ne(b, 0)), (x
**4*acot(a)/4, True))
```

Giac [A] time = 1.12715, size = 142, normalized size = 1.34

$$\frac{1}{4}\,x^4\arctan\left(\frac{1}{bx+a}\right)+\frac{1}{12}\,b\left(\frac{3\left(a^4-6\,a^2+1\right)\arctan\,(bx+a)}{b^5}-\frac{6\left(a^3-a\right)\log\left(b^2x^2+2\,abx+a^2+1\right)}{b^5}+\frac{b^4x^3-3\,ab^3x^2}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(b*x+a),x, algorithm="giac")
```

```
[Out] 1/4*x^4*arctan(1/(b*x + a)) + 1/12*b*(3*(a^4 - 6*a^2 + 1)*arctan(b*x + a)/b
^5 - 6*(a^3 - a)*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b^5 + (b^4*x^3 - 3*a*b^3*
x^2 + 9*a^2*b^2*x - 3*b^2*x)/b^6)
```

3.100 $\int x^2 \cot^{-1}(a+bx)\,dx$

Optimal. Leaf size=80

$$-\frac{(1-3a^2)\log\left((a+bx)^2+1\right)}{6b^3}+\frac{a(3-a^2)\tan^{-1}(a+bx)}{3b^3}-\frac{ax}{b^2}+\frac{(a+bx)^2}{6b^3}+\frac{1}{3}x^3\cot^{-1}(a+bx)$$

```
[Out] -((a*x)/b^2) + (a + b*x)^2/(6*b^3) + (x^3*ArcCot[a + b*x])/3 + (a*(3 - a^2)
*ArcTan[a + b*x])/(3*b^3) - ((1 - 3*a^2)*Log[1 + (a + b*x)^2])/(6*b^3)
```

Rubi [A] time = 0.0782526, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {5048, 4863, 702, 635, 203, 260}

$$-\frac{(1-3a^2)\log\left((a+bx)^2+1\right)}{6b^3}+\frac{a(3-a^2)\tan^{-1}(a+bx)}{3b^3}-\frac{ax}{b^2}+\frac{(a+bx)^2}{6b^3}+\frac{1}{3}x^3\cot^{-1}(a+bx)$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[a + b*x],x]
```

```
[Out] -((a*x)/b^2) + (a + b*x)^2/(6*b^3) + (x^3*ArcCot[a + b*x])/3 + (a*(3 - a^2)
*ArcTan[a + b*x])/(3*b^3) - ((1 - 3*a^2)*Log[1 + (a + b*x)^2])/(6*b^3)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 702

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Polyno
mialDivide[(d + e*x)^m, a + c*x^2, x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[
```

```
c*d^2 + a*e^2, 0] && IGtQ[m, 1] && (NeQ[d, 0] || GtQ[m, 2])
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$
\begin{aligned}
\int x^2 \cot^{-1}(a+bx)\,dx &= \frac{\text{Subst}\left(\int \left(-\frac{a}{b}+\frac{x}{b}\right)^2 \cot^{-1}(x)\,dx, x, a+bx\right)}{b}\\
&= \frac{1}{3}x^3\cot^{-1}(a+bx)+\frac{1}{3}\text{Subst}\left(\int \frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^3}{1+x^2}\,dx, x, a+bx\right)\\
&= \frac{1}{3}x^3\cot^{-1}(a+bx)+\frac{1}{3}\text{Subst}\left(\int \left(-\frac{3a}{b^3}+\frac{x}{b^3}+\frac{a\left(3-a^2\right)-\left(1-3a^2\right)x}{b^3\left(1+x^2\right)}\right)dx, x, a+bx\right)\\
&= -\frac{ax}{b^2}+\frac{(a+bx)^2}{6b^3}+\frac{1}{3}x^3\cot^{-1}(a+bx)+\frac{\text{Subst}\left(\int \frac{a\left(3-a^2\right)-\left(1-3a^2\right)x}{1+x^2}\,dx, x, a+bx\right)}{3b^3}\\
&= -\frac{ax}{b^2}+\frac{(a+bx)^2}{6b^3}+\frac{1}{3}x^3\cot^{-1}(a+bx)-\frac{\left(1-3a^2\right)\text{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a+bx\right)}{3b^3}+\frac{\left(a\left(3-a^2\right)\right)\text{S}\ldots}{\ldots}\\
&= -\frac{ax}{b^2}+\frac{(a+bx)^2}{6b^3}+\frac{1}{3}x^3\cot^{-1}(a+bx)+\frac{a\left(3-a^2\right)\tan^{-1}(a+bx)}{3b^3}-\frac{\left(1-3a^2\right)\log\left(1+(a+bx)\ldots\right.}{6b^3}
\end{aligned}
$$

Mathematica [C] time = 0.0418469, size = 114, normalized size = 1.42

$$\frac{\frac{1}{3}b\left(\frac{a+bx}{b}-\frac{a}{b}\right)^3\cot^{-1}(a+bx)+\frac{1}{3}b\left(\frac{(a+bx)^2}{2b^3}-\frac{3ax}{b^2}-\frac{(1-ia)^3\log(a+bx+i)}{2b^3}-\frac{(1+ia)^3\log(-a-bx+i)}{2b^3}\right)}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[a + b*x],x]
```

```
[Out] ((b*(-(a/b) + (a + b*x)/b)^3*ArcCot[a + b*x])/3 + (b*((-3*a*x)/b^2 + (a + b
*x)^2/(2*b^3) - ((1 + I*a)^3*Log[I - a - b*x])/(2*b^3) - ((1 - I*a)^3*Log[I
 + a + b*x])/(2*b^3)))/3)/b
```

Maple [A] time = 0.041, size = 94, normalized size = 1.2

$$\frac{x^3\mathrm{arccot}\,(bx+a)}{3}+\frac{x^2}{6\,b}-\frac{2\,ax}{3\,b^2}-\frac{5\,a^2}{6\,b^3}+\frac{\ln\left(1+(bx+a)^2\right)a^2}{2\,b^3}-\frac{\ln\left(1+(bx+a)^2\right)}{6\,b^3}-\frac{\arctan\,(bx+a)\,a^3}{3\,b^3}+\frac{\arctan\,(bx+}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(b*x+a),x)
```

```
[Out] 1/3*x^3*arccot(b*x+a)+1/6/b*x^2-2/3*a*x/b^2-5/6/b^3*a^2+1/2/b^3*ln(1+(b*x+a
)^2)*a^2-1/6/b^3*ln(1+(b*x+a)^2)-1/3/b^3*arctan(b*x+a)*a^3+1/b^3*arctan(b*x
+a)*a
```

Maxima [A] time = 1.47509, size = 115, normalized size = 1.44

$$\frac{1}{3}\,x^3\,\mathrm{arccot}\,(bx+a)+\frac{1}{6}\,b\left(\frac{bx^2-4\,ax}{b^3}-\frac{2\left(a^3-3\,a\right)\arctan\left(\frac{b^2x+ab}{b}\right)}{b^4}+\frac{\left(3\,a^2-1\right)\log\left(b^2x^2+2\,abx+a^2+1\right)}{b^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot(b*x + a) + 1/6*b*((b*x^2 - 4*a*x)/b^3 - 2*(a^3 - 3*a)*arctan
((b^2*x + a*b)/b)/b^4 + (3*a^2 - 1)*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b^4)
```

Fricas [A] time = 2.20814, size = 184, normalized size = 2.3

$$\frac{2\,b^3x^3\,\mathrm{arccot}\,(bx+a)+b^2x^2-4\,abx-2\left(a^3-3\,a\right)\arctan\,(bx+a)+\left(3\,a^2-1\right)\log\left(b^2x^2+2\,abx+a^2+1\right)}{6\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^3*arccot(b*x + a) + b^2*x^2 - 4*a*b*x - 2*(a^3 - 3*a)*arctan(b
*x + a) + (3*a^2 - 1)*log(b^2*x^2 + 2*a*b*x + a^2 + 1))/b^3
```

Sympy [A] time = 1.30885, size = 117, normalized size = 1.46

$$\begin{cases} \frac{a^3\,\mathrm{acot}\,(a+bx)}{3b^3}+\frac{a^2\log\left(a^2+2abx+b^2x^2+1\right)}{2b^3}-\frac{2ax}{3b^2}-\frac{a\,\mathrm{acot}\,(a+bx)}{b^3}+\frac{x^3\,\mathrm{acot}\,(a+bx)}{3}+\frac{x^2}{6b}-\frac{\log\left(a^2+2abx+b^2x^2+1\right)}{6b^3} & \text{for } b\neq 0 \\ \frac{x^3\,\mathrm{acot}\,(a)}{3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(b*x+a),x)
```

```
[Out] Piecewise((a**3*acot(a + b*x)/(3*b**3) + a**2*log(a**2 + 2*a*b*x + b**2*x**
2 + 1)/(2*b**3) - 2*a*x/(3*b**2) - a*acot(a + b*x)/b**3 + x**3*acot(a + b*x
)/3 + x**2/(6*b) - log(a**2 + 2*a*b*x + b**2*x**2 + 1)/(6*b**3), Ne(b, 0)),
 (x**3*acot(a)/3, True))
```

Giac [A] time = 1.12045, size = 113, normalized size = 1.41

$$\frac{1}{3}\,x^3\arctan\left(\frac{1}{bx+a}\right)-\frac{1}{6}\,b\left(\frac{2\left(a^3-3\,a\right)\arctan\,(bx+a)}{b^4}-\frac{\left(3\,a^2-1\right)\log\left(b^2x^2+2\,abx+a^2+1\right)}{b^4}-\frac{b^2x^2-4\,abx}{b^4}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(b*x+a),x, algorithm="giac")
```

```
[Out] 1/3*x^3*arctan(1/(b*x + a)) - 1/6*b*(2*(a^3 - 3*a)*arctan(b*x + a)/b^4 - (3
*a^2 - 1)*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b^4 - (b^2*x^2 - 4*a*b*x)/b^4)
```

3.101 $\int x \cot^{-1}(a+bx)\,dx$

Optimal. Leaf size=60

$$-\frac{(1-a^2)\tan^{-1}(a+bx)}{2b^2}-\frac{a\log\left((a+bx)^2+1\right)}{2b^2}+\frac{1}{2}x^2\cot^{-1}(a+bx)+\frac{x}{2b}$$

```
[Out] x/(2*b) + (x^2*ArcCot[a + b*x])/2 - ((1 - a^2)*ArcTan[a + b*x])/(2*b^2) - (
a*Log[1 + (a + b*x)^2])/(2*b^2)
```

Rubi [A] time = 0.0553805, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.75, Rules used = {5048, 4863, 702, 635, 203, 260}

$$-\frac{(1-a^2)\tan^{-1}(a+bx)}{2b^2}-\frac{a\log\left((a+bx)^2+1\right)}{2b^2}+\frac{1}{2}x^2\cot^{-1}(a+bx)+\frac{x}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[a + b*x],x]
```

```
[Out] x/(2*b) + (x^2*ArcCot[a + b*x])/2 - ((1 - a^2)*ArcTan[a + b*x])/(2*b^2) - (
a*Log[1 + (a + b*x)^2])/(2*b^2)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 702

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Polyno
mialDivide[(d + e*x)^m, a + c*x^2, x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[
```

```
c*d^2 + a*e^2, 0] && IGtQ[m, 1] && (NeQ[d, 0] || GtQ[m, 2])
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}
\int x\cot^{-1}(a+bx)\,dx &= \frac{\text{Subst}\left(\int\left(-\frac{a}{b}+\frac{x}{b}\right)\cot^{-1}(x)\,dx,x,a+bx\right)}{b}\\
&= \frac{1}{2}x^2\cot^{-1}(a+bx)+\frac{1}{2}\text{Subst}\left(\int\frac{\left(-\frac{a}{b}+\frac{x}{b}\right)^2}{1+x^2}\,dx,x,a+bx\right)\\
&= \frac{1}{2}x^2\cot^{-1}(a+bx)+\frac{1}{2}\text{Subst}\left(\int\left(\frac{1}{b^2}-\frac{1-a^2+2ax}{b^2\left(1+x^2\right)}\right)dx,x,a+bx\right)\\
&= \frac{x}{2b}+\frac{1}{2}x^2\cot^{-1}(a+bx)-\frac{\text{Subst}\left(\int\frac{1-a^2+2ax}{1+x^2}\,dx,x,a+bx\right)}{2b^2}\\
&= \frac{x}{2b}+\frac{1}{2}x^2\cot^{-1}(a+bx)-\frac{a\,\text{Subst}\left(\int\frac{x}{1+x^2}\,dx,x,a+bx\right)}{b^2}-\frac{\left(1-a^2\right)\text{Subst}\left(\int\frac{1}{1+x^2}\,dx,x,a+bx\right)}{2b^2}\\
&= \frac{x}{2b}+\frac{1}{2}x^2\cot^{-1}(a+bx)-\frac{\left(1-a^2\right)\tan^{-1}(a+bx)}{2b^2}-\frac{a\log\left(1+(a+bx)^2\right)}{2b^2}
\end{aligned}$$

Mathematica [C] time = 0.0328707, size = 90, normalized size = 1.5

$$\frac{ia^2\log(a+bx+i)+2b^2x^2\cot^{-1}(a+bx)-2a\log(a+bx+i)-i(a-i)^2\log(-a-bx+i)-i\log(a+bx+i)+2bx}{4b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[a + b*x],x]
```

```
[Out] (2*b*x + 2*b^2*x^2*ArcCot[a + b*x] - I*(-I + a)^2*Log[I - a - b*x] - I*Log[
I + a + b*x] - 2*a*Log[I + a + b*x] + I*a^2*Log[I + a + b*x])/(4*b^2)
```

Maple [A] time = 0.044, size = 66, normalized size = 1.1

$$\frac{x^2 \operatorname{arccot}(bx+a)}{2} - \frac{\operatorname{arccot}(bx+a)\,a^2}{2\,b^2} + \frac{x}{2\,b} + \frac{a}{2\,b^2} - \frac{a\ln\left(1+(bx+a)^2\right)}{2\,b^2} - \frac{\arctan(bx+a)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(b*x+a),x)
```

```
[Out] 1/2*x^2*arccot(b*x+a)-1/2/b^2*arccot(b*x+a)*a^2+1/2*x/b+1/2/b^2*a-1/2*a*ln(
1+(b*x+a)^2)/b^2-1/2/b^2*arctan(b*x+a)
```

Maxima [A] time = 1.47358, size = 92, normalized size = 1.53

$$\frac{1}{2}\,x^2\operatorname{arccot}(bx+a) + \frac{1}{2}\,b\left(\frac{x}{b^2} + \frac{\left(a^2-1\right)\arctan\left(\frac{b^2x+ab}{b}\right)}{b^3} - \frac{a\log\left(b^2x^2+2\,abx+a^2+1\right)}{b^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arccot(b*x + a) + 1/2*b*(x/b^2 + (a^2 - 1)*arctan((b^2*x + a*b)/b)/
b^3 - a*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b^3)
```

Fricas [A] time = 2.2728, size = 143, normalized size = 2.38

$$\frac{b^2x^2\operatorname{arccot}(bx+a) + bx + \left(a^2-1\right)\arctan(bx+a) - a\log\left(b^2x^2+2\,abx+a^2+1\right)}{2\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*x^2*arccot(b*x + a) + b*x + (a^2 - 1)*arctan(b*x + a) - a*log(b^2*
x^2 + 2*a*b*x + a^2 + 1))/b^2
```

Sympy [A] time = 0.833307, size = 78, normalized size = 1.3

$$\begin{cases} -\frac{a^2 \operatorname{acot}(a+bx)}{2b^2} - \frac{a \log\left(a^2+2abx+b^2x^2+1\right)}{2b^2} + \frac{x^2 \operatorname{acot}(a+bx)}{2} + \frac{x}{2b} + \frac{\operatorname{acot}(a+bx)}{2b^2} & \text{for } b \neq 0 \\ \frac{x^2 \operatorname{acot}(a)}{2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(b*x+a),x)
```

```
[Out] Piecewise((-a**2*acot(a + b*x)/(2*b**2) - a*log(a**2 + 2*a*b*x + b**2*x**2
+ 1)/(2*b**2) + x**2*acot(a + b*x)/2 + x/(2*b) + acot(a + b*x)/(2*b**2), Ne
(b, 0)), (x**2*acot(a)/2, True))
```

Giac [A] time = 1.09278, size = 84, normalized size = 1.4

$$\frac{1}{2}\,x^2 \arctan\left(\frac{1}{bx+a}\right) + \frac{1}{2}\,b\left(\frac{x}{b^2} + \frac{\left(a^2-1\right)\arctan\left(bx+a\right)}{b^3} - \frac{a\log\left(b^2x^2+2\,abx+a^2+1\right)}{b^3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*x^2*arctan(1/(b*x + a)) + 1/2*b*(x/b^2 + (a^2 - 1)*arctan(b*x + a)/b^3
- a*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b^3)
```

3.102 $\int \cot^{-1}(a+bx)\,dx$

Optimal. Leaf size=33

$$\frac{\log\left((a+bx)^2+1\right)}{2b}+\frac{(a+bx)\cot^{-1}(a+bx)}{b}$$

```
[Out] ((a + b*x)*ArcCot[a + b*x])/b + Log[1 + (a + b*x)^2]/(2*b)
```

Rubi [A] time = 0.0115419, antiderivative size = 33, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {5040, 4847, 260}

$$\frac{\log\left((a+bx)^2+1\right)}{2b}+\frac{(a+bx)\cot^{-1}(a+bx)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x],x]
```

```
[Out] ((a + b*x)*ArcCot[a + b*x])/b + Log[1 + (a + b*x)^2]/(2*b)
```

Rule 5040

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d},
x] && IGtQ[p, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \cot^{-1}(a+bx)\,dx = \frac{\text{Subst}\left(\int \cot^{-1}(x)\,dx, x, a+bx\right)}{b}$$
$$= \frac{(a+bx)\cot^{-1}(a+bx)}{b} + \frac{\text{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a+bx\right)}{b}$$
$$= \frac{(a+bx)\cot^{-1}(a+bx)}{b} + \frac{\log\left(1+(a+bx)^2\right)}{2b}$$

Mathematica [A] time = 0.013004, size = 44, normalized size = 1.33

$$\frac{\log\left(a^2+2abx+b^2x^2+1\right)-2a\tan^{-1}(a+bx)}{2b}+x\cot^{-1}(a+bx)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x],x]
```

```
[Out] x*ArcCot[a + b*x] + (-2*a*ArcTan[a + b*x] + Log[1 + a^2 + 2*a*b*x + b^2*x^2
])/(2*b)
```

Maple [A] time = 0.039, size = 36, normalized size = 1.1

$$x\text{arccot}\,(bx+a)+\frac{\text{arccot}\,(bx+a)\,a}{b}+\frac{\ln\left(1+(bx+a)^2\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a),x)
```

```
[Out] x*arccot(b*x+a)+1/b*arccot(b*x+a)*a+1/2*ln(1+(b*x+a)^2)/b
```

Maxima [A] time = 0.956345, size = 39, normalized size = 1.18

$$\frac{2\,(bx+a)\,\text{arccot}\,(bx+a)+\log\left((bx+a)^2+1\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*(2*(b*x + a)*arccot(b*x + a) + log((b*x + a)^2 + 1))/b
```

Fricas [A] time = 2.14645, size = 119, normalized size = 3.61

$$\frac{2\,bx\,\mathrm{arccot}\left(bx+a\right)-2\,a\arctan\left(bx+a\right)+\log\left(b^{2}x^{2}+2\,abx+a^{2}+1\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x*arccot(b*x + a) - 2*a*arctan(b*x + a) + log(b^2*x^2 + 2*a*b*x +
a^2 + 1))/b
```

Sympy [A] time = 0.487655, size = 46, normalized size = 1.39

$$\begin{cases}\frac{a\,\mathrm{acot}\left(a+bx\right)}{b}+x\,\mathrm{acot}\left(a+bx\right)+\frac{\log\left(a^{2}+2abx+b^{2}x^{2}+1\right)}{2b} & \text{for}\ b\neq 0\\ x\,\mathrm{acot}\left(a\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a),x)
```

```
[Out] Piecewise((a*acot(a + b*x)/b + x*acot(a + b*x) + log(a**2 + 2*a*b*x + b**2*
x**2 + 1)/(2*b), Ne(b, 0)), (x*acot(a), True))
```

Giac [A] time = 1.11836, size = 68, normalized size = 2.06

$$-\frac{1}{2}\,b\left(\frac{2\,a\arctan\left(bx+a\right)}{b^{2}}-\frac{\log\left(b^{2}x^{2}+2\,abx+a^{2}+1\right)}{b^{2}}\right)+x\arctan\left(\frac{1}{bx+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a),x, algorithm="giac")
```

```
[Out] -1/2*b*(2*a*arctan(b*x + a)/b^2 - log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b^2) + x
*arctan(1/(b*x + a))
```

3.103 $\int \frac{\cot^{-1}(a+bx)}{x}\,dx$

Optimal. Leaf size=120

$$-\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1-i(a+bx)}\right)+\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2bx}{(-a+i)(1-i(a+bx))}\right)+\log\left(\frac{2}{1-i(a+bx)}\right)\left(-\cot^{-1}(a+bx)\right)$$

```
[Out] -(ArcCot[a + b*x]*Log[2/(1 - I*(a + b*x))]) + ArcCot[a + b*x]*Log[(2*b*x)/(
(I - a)*(1 - I*(a + b*x)))] - (I/2)*PolyLog[2, 1 - 2/(1 - I*(a + b*x))] + (
I/2)*PolyLog[2, 1 - (2*b*x)/((I - a)*(1 - I*(a + b*x)))]
```

Rubi [A] time = 0.10834, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {5048, 4857, 2402, 2315, 2447}

$$-\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2}{1-i(a+bx)}\right)+\frac{1}{2}i\text{PolyLog}\left(2,1-\frac{2bx}{(-a+i)(1-i(a+bx))}\right)+\log\left(\frac{2}{1-i(a+bx)}\right)\left(-\cot^{-1}(a+bx)\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/x,x]
```

```
[Out] -(ArcCot[a + b*x]*Log[2/(1 - I*(a + b*x))]) + ArcCot[a + b*x]*Log[(2*b*x)/(
(I - a)*(1 - I*(a + b*x)))] - (I/2)*PolyLog[2, 1 - 2/(1 - I*(a + b*x))] + (
I/2)*PolyLog[2, 1 - (2*b*x)/((I - a)*(1 - I*(a + b*x)))]
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{x}\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{-\frac{a}{b}+\frac{x}{b}}\,dx, x, a+bx\right)}{b}$$

$$= -\cot^{-1}(a+bx)\log\left(\frac{2}{1-i(a+bx)}\right)+\cot^{-1}(a+bx)\log\left(\frac{2bx}{(i-a)(1-i(a+bx))}\right)-\text{Subst}\left(\int \frac{\log(}{1-}\right.$$

$$= -\cot^{-1}(a+bx)\log\left(\frac{2}{1-i(a+bx)}\right)+\cot^{-1}(a+bx)\log\left(\frac{2bx}{(i-a)(1-i(a+bx))}\right)+\frac{1}{2}i\text{Li}_2\left(1-\frac{}{(i-}\right.$$

$$= -\cot^{-1}(a+bx)\log\left(\frac{2}{1-i(a+bx)}\right)+\cot^{-1}(a+bx)\log\left(\frac{2bx}{(i-a)(1-i(a+bx))}\right)-\frac{1}{2}i\text{Li}_2\left(1-\frac{}{1-}\right.$$

Mathematica [B] time = 0.024878, size = 251, normalized size = 2.09

$$-\frac{1}{2}i\text{PolyLog}\left(2,-\frac{b\left(\frac{a+bx}{b}-\frac{a}{b}\right)}{a-i}\right)+\frac{1}{2}i\text{PolyLog}\left(2,-\frac{b\left(\frac{a+bx}{b}-\frac{a}{b}\right)}{a+i}\right)-\frac{1}{2}i\log\left(\frac{a+bx-i}{b\left(\frac{a}{b}-\frac{i}{b}\right)}\right)\log\left(\frac{a+bx}{b}-\frac{a}{b}\right)+\frac{1}{2}i\log\left(\frac{a+}{a}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/x,x]
```

```
[Out] (-I/2)*Log[(-I + a + b*x)/(((-I)/b + a/b)*b)]*Log[-(a/b) + (a + b*x)/b] + (
I/2)*Log[(-I + a + b*x)/(a + b*x)]*Log[-(a/b) + (a + b*x)/b] + (I/2)*Log[(I
 + a + b*x)/((I/b + a/b)*b)]*Log[-(a/b) + (a + b*x)/b] - (I/2)*Log[(I + a +
 b*x)/(a + b*x)]*Log[-(a/b) + (a + b*x)/b] - (I/2)*PolyLog[2, -((b*(-(a/b)
+ (a + b*x)/b))/(-I + a))] + (I/2)*PolyLog[2, -((b*(-(a/b) + (a + b*x)/b))/
(I + a))]
```

Maple [A] time = 0.056, size = 103, normalized size = 0.9

$$\ln(bx)\operatorname{arccot}(bx+a) - \frac{i}{2}\ln(bx)\ln\left(\frac{i-a-bx}{i-a}\right) + \frac{i}{2}\ln(bx)\ln\left(\frac{i+a+bx}{i+a}\right) - \frac{i}{2}\operatorname{dilog}\left(\frac{i-a-bx}{i-a}\right) + \frac{i}{2}\operatorname{dilog}\left(\frac{i+a+bx}{i+a}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/x,x)
```

```
[Out] ln(b*x)*arccot(b*x+a)-1/2*I*ln(b*x)*ln((I-a-b*x)/(I-a))+1/2*I*ln(b*x)*ln((I
+a+b*x)/(I+a))-1/2*I*dilog((I-a-b*x)/(I-a))+1/2*I*dilog((I+a+b*x)/(I+a))
```

Maxima [A] time = 1.64997, size = 180, normalized size = 1.5

$$\frac{1}{2}\arctan\left(\frac{bx}{a^2+1}, -\frac{abx}{a^2+1}\right)\log\left(b^2x^2+2\,abx+a^2+1\right) - \frac{1}{2}\arctan(bx+a)\log\left(\frac{b^2x^2}{a^2+1}\right) + \operatorname{arccot}(bx+a)\log(x) + \operatorname{arc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x,x, algorithm="maxima")
```

```
[Out] 1/2*arctan2(b*x/(a^2 + 1), -a*b*x/(a^2 + 1))*log(b^2*x^2 + 2*a*b*x + a^2 +
1) - 1/2*arctan(b*x + a)*log(b^2*x^2/(a^2 + 1)) + arccot(b*x + a)*log(x) +
arctan((b^2*x + a*b)/b)*log(x) + 1/2*I*dilog((I*b*x + I*a + 1)/(I*a + 1)) -
 1/2*I*dilog((I*b*x + I*a - 1)/(I*a - 1))
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(bx+a)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(b*x + a)/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(a+bx)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/x,x)
```

```
[Out] Integral(acot(a + b*x)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/x, x)
```

3.104 $\int \frac{\cot^{-1}(a+bx)}{x^2} dx$

Optimal. Leaf size=62

$$-\frac{b\log(x)}{a^2+1}+\frac{b\log\left((a+bx)^2+1\right)}{2\left(a^2+1\right)}+\frac{ab\tan^{-1}(a+bx)}{a^2+1}-\frac{\cot^{-1}(a+bx)}{x}$$

```
[Out] -(ArcCot[a + b*x]/x) + (a*b*ArcTan[a + b*x])/(1 + a^2) - (b*Log[x])/(1 + a^
2) + (b*Log[1 + (a + b*x)^2])/(2*(1 + a^2))
```

Rubi [A] time = 0.0393536, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {5046, 371, 706, 31, 635, 203, 260}

$$-\frac{b\log(x)}{a^2+1}+\frac{b\log\left((a+bx)^2+1\right)}{2\left(a^2+1\right)}+\frac{ab\tan^{-1}(a+bx)}{a^2+1}-\frac{\cot^{-1}(a+bx)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/x^2,x]
```

```
[Out] -(ArcCot[a + b*x]/x) + (a*b*ArcTan[a + b*x])/(1 + a^2) - (b*Log[x])/(1 + a^
2) + (b*Log[1 + (a + b*x)^2])/(2*(1 + a^2))
```

Rule 5046

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
 + d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 371

```
Int[((a_) + (b_.)*(v_)^(n_))^(p_.)*(x_)^(m_.), x_Symbol] :> With[{c = Coeff
icient[v, x, 0], d = Coefficient[v, x, 1]}, Dist[1/d^(m + 1), Subst[Int[Sim
plifyIntegrand[(x - c)^m*(a + b*x^n)^p, x], x], x, v], x] /; NeQ[c, 0]] /;
FreeQ[{a, b, n, p}, x] && LinearQ[v, x] && IntegerQ[m]
```

Rule 706

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[e^2/(c
*d^2 + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d^2 + a*e^2), Int[(c*d -
 c*e*x)/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2,
 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}(a+bx)}{x^2}\,dx &= -\frac{\cot^{-1}(a+bx)}{x} - b\int \frac{1}{x\left(1+(a+bx)^2\right)}\,dx \\
&= -\frac{\cot^{-1}(a+bx)}{x} - b\,\mathrm{Subst}\left(\int \frac{1}{(-a+x)\left(1+x^2\right)}\,dx, x, a+bx\right) \\
&= -\frac{\cot^{-1}(a+bx)}{x} - \frac{b\,\mathrm{Subst}\left(\int \frac{1}{-a+x}\,dx, x, a+bx\right)}{1+a^2} - \frac{b\,\mathrm{Subst}\left(\int \frac{-a-x}{1+x^2}\,dx, x, a+bx\right)}{1+a^2} \\
&= -\frac{\cot^{-1}(a+bx)}{x} - \frac{b\log(x)}{1+a^2} + \frac{b\,\mathrm{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a+bx\right)}{1+a^2} + \frac{(ab)\,\mathrm{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, a+bx\right)}{1+a^2} \\
&= -\frac{\cot^{-1}(a+bx)}{x} + \frac{ab\tan^{-1}(a+bx)}{1+a^2} - \frac{b\log(x)}{1+a^2} + \frac{b\log\left(1+(a+bx)^2\right)}{2\left(1+a^2\right)}
\end{aligned}
$$

Mathematica [C] time = 0.0521144, size = 66, normalized size = 1.06

$$-\frac{\cot^{-1}(a+bx)}{x}+\frac{b((1-ia)\log(-a-bx+i)+(1+ia)\log(a+bx+i)-2\log(x))}{2\left(a^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/x^2,x]
```

```
[Out] -(ArcCot[a + b*x]/x) + (b*(-2*Log[x] + (1 - I*a)*Log[I - a - b*x] + (1 + I*
a)*Log[I + a + b*x]))/(2*(1 + a^2))
```

Maple [A] time = 0.049, size = 63, normalized size = 1.

$$-\frac{\operatorname{arccot}(bx+a)}{x}+\frac{b\ln\left(1+(bx+a)^2\right)}{2a^2+2}+\frac{ab\arctan(bx+a)}{a^2+1}-\frac{b\ln(bx)}{a^2+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/x^2,x)
```

```
[Out] -arccot(b*x+a)/x+1/2*b*ln(1+(b*x+a)^2)/(a^2+1)+a*b*arctan(b*x+a)/(a^2+1)-b/
(a^2+1)*ln(b*x)
```

Maxima [A] time = 1.47844, size = 104, normalized size = 1.68

$$\frac{1}{2}b\left(\frac{2a\arctan\left(\frac{b^2x+ab}{b}\right)}{a^2+1}+\frac{\log\left(b^2x^2+2abx+a^2+1\right)}{a^2+1}-\frac{2\log(x)}{a^2+1}\right)-\frac{\operatorname{arccot}(bx+a)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^2,x, algorithm="maxima")
```

```
[Out] 1/2*b*(2*a*arctan((b^2*x + a*b)/b)/(a^2 + 1) + log(b^2*x^2 + 2*a*b*x + a^2
+ 1)/(a^2 + 1) - 2*log(x)/(a^2 + 1)) - arccot(b*x + a)/x
```

Fricas [A] time = 2.31603, size = 174, normalized size = 2.81

$$\frac{2\,abx\arctan\left(bx+a\right)+bx\log\left(b^{2}x^{2}+2\,abx+a^{2}+1\right)-2\,bx\log\left(x\right)-2\left(a^{2}+1\right)\operatorname{arccot}\left(bx+a\right)}{2\left(a^{2}+1\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^2,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a*b*x*arctan(b*x + a) + b*x*log(b^2*x^2 + 2*a*b*x + a^2 + 1) - 2*b*x
*log(x) - 2*(a^2 + 1)*arccot(b*x + a))/((a^2 + 1)*x)
```

Sympy [B] time = 9.50362, size = 330, normalized size = 5.32

$$\begin{cases} -\frac{2ib^{2}x^{2}\operatorname{acot}\left(bx-i\right)}{4bx^{2}-8ix}+\frac{b^{2}x^{2}}{4bx^{2}-8ix}-\frac{8bx\operatorname{acot}\left(bx-i\right)}{4bx^{2}-8ix}+\frac{8i\operatorname{acot}\left(bx-i\right)}{4bx^{2}-8ix}+\frac{4}{4bx^{2}-8ix} & \text{for}\: a=-i \\ \frac{2ib^{2}x^{2}\operatorname{acot}\left(bx+i\right)}{4bx^{2}+8ix}+\frac{b^{2}x^{2}}{4bx^{2}+8ix}-\frac{8bx\operatorname{acot}\left(bx+i\right)}{4bx^{2}+8ix}-\frac{8i\operatorname{acot}\left(bx+i\right)}{4bx^{2}+8ix}+\frac{4}{4bx^{2}+8ix} & \text{for}\: a=i \\ -\frac{2a^{2}\operatorname{acot}\left(a+bx\right)}{2a^{2}x+2x}-\frac{2abx\operatorname{acot}\left(a+bx\right)}{2a^{2}x+2x}-\frac{2bx\log\left(x\right)}{2a^{2}x+2x}+\frac{bx\log\left(a^{2}+2abx+b^{2}x^{2}+1\right)}{2a^{2}x+2x}-\frac{2\operatorname{acot}\left(a+bx\right)}{2a^{2}x+2x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/x**2,x)
```

```
[Out] Piecewise((-2*I*b**2*x**2*acot(b*x - I)/(4*b*x**2 - 8*I*x) + b**2*x**2/(4*b
*x**2 - 8*I*x) - 8*b*x*acot(b*x - I)/(4*b*x**2 - 8*I*x) + 8*I*acot(b*x - I)
/(4*b*x**2 - 8*I*x) + 4/(4*b*x**2 - 8*I*x), Eq(a, -I)), (2*I*b**2*x**2*acot
(b*x + I)/(4*b*x**2 + 8*I*x) + b**2*x**2/(4*b*x**2 + 8*I*x) - 8*b*x*acot(b*
x + I)/(4*b*x**2 + 8*I*x) - 8*I*acot(b*x + I)/(4*b*x**2 + 8*I*x) + 4/(4*b*x
**2 + 8*I*x), Eq(a, I)), (-2*a**2*acot(a + b*x)/(2*a**2*x + 2*x) - 2*a*b*x*
acot(a + b*x)/(2*a**2*x + 2*x) - 2*b*x*log(x)/(2*a**2*x + 2*x) + b*x*log(a*
*2 + 2*a*b*x + b**2*x**2 + 1)/(2*a**2*x + 2*x) - 2*acot(a + b*x)/(2*a**2*x
+ 2*x), True))
```

Giac [A] time = 1.11117, size = 97, normalized size = 1.56

$$\frac{1}{2}\,b\left(\frac{2\,a\arctan\left(bx+a\right)}{a^{2}+1}+\frac{\log\left(b^{2}x^{2}+2\,abx+a^{2}+1\right)}{a^{2}+1}-\frac{2\,\log\left(|x|\right)}{a^{2}+1}\right)-\frac{\arctan\left(\frac{1}{bx+a}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^2,x, algorithm="giac")
```

```
[Out] 1/2*b*(2*a*arctan(b*x + a)/(a^2 + 1) + log(b^2*x^2 + 2*a*b*x + a^2 + 1)/(a^
2 + 1) - 2*log(abs(x))/(a^2 + 1)) - arctan(1/(b*x + a))/x
```

3.105 $\int \frac{\cot^{-1}(a+bx)}{x^3} \, dx$

Optimal. Leaf size=95

$$\frac{ab^2\log(x)}{(a^2+1)^2}-\frac{ab^2\log\left((a+bx)^2+1\right)}{2(a^2+1)^2}+\frac{(1-a^2)\,b^2\tan^{-1}(a+bx)}{2(a^2+1)^2}+\frac{b}{2(a^2+1)\,x}-\frac{\cot^{-1}(a+bx)}{2x^2}$$

```
[Out] b/(2*(1 + a^2)*x) - ArcCot[a + b*x]/(2*x^2) + ((1 - a^2)*b^2*ArcTan[a + b*x
])/(2*(1 + a^2)^2) + (a*b^2*Log[x])/(1 + a^2)^2 - (a*b^2*Log[1 + (a + b*x)^
2])/(2*(1 + a^2)^2)
```

Rubi [A] time = 0.0821167, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {5046, 371, 710, 801, 635, 203, 260}

$$\frac{ab^2\log(x)}{(a^2+1)^2}-\frac{ab^2\log\left((a+bx)^2+1\right)}{2(a^2+1)^2}+\frac{(1-a^2)\,b^2\tan^{-1}(a+bx)}{2(a^2+1)^2}+\frac{b}{2(a^2+1)\,x}-\frac{\cot^{-1}(a+bx)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/x^3,x]
```

```
[Out] b/(2*(1 + a^2)*x) - ArcCot[a + b*x]/(2*x^2) + ((1 - a^2)*b^2*ArcTan[a + b*x
])/(2*(1 + a^2)^2) + (a*b^2*Log[x])/(1 + a^2)^2 - (a*b^2*Log[1 + (a + b*x)^
2])/(2*(1 + a^2)^2)
```

Rule 5046

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
 + d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 371

```
Int[((a_) + (b_.)*(v_)^(n_))^(p_.)*(x_)^(m_.), x_Symbol] :> With[{c = Coeff
icient[v, x, 0], d = Coefficient[v, x, 1]}, Dist[1/d^(m + 1), Subst[Int[Sim
plifyIntegrand[(x - c)^m*(a + b*x^n)^p, x], x], x, v], x] /; NeQ[c, 0]] /;
```

```
FreeQ[{a, b, n, p}, x] && LinearQ[v, x] && IntegerQ[m]
```

Rule 710

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Simp[(e*(d
 + e*x)^(m + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + Dist[c/(c*d^2 + a*e^2), In
t[((d + e*x)^(m + 1)*(d - e*x))/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e, m
}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\cot^{-1}(a+bx)}{x^3}\,dx &= -\frac{\cot^{-1}(a+bx)}{2x^2} - \frac{1}{2}b\int \frac{1}{x^2\left(1+(a+bx)^2\right)}\,dx \\
&= -\frac{\cot^{-1}(a+bx)}{2x^2} - \frac{1}{2}b^2\,\mathrm{Subst}\left(\int \frac{1}{(-a+x)^2\left(1+x^2\right)}\,dx, x, a+bx\right) \\
&= \frac{b}{2\left(1+a^2\right)x} - \frac{\cot^{-1}(a+bx)}{2x^2} - \frac{b^2\,\mathrm{Subst}\left(\int \frac{-a-x}{(-a+x)\left(1+x^2\right)}\,dx, x, a+bx\right)}{2\left(1+a^2\right)} \\
&= \frac{b}{2\left(1+a^2\right)x} - \frac{\cot^{-1}(a+bx)}{2x^2} - \frac{b^2\,\mathrm{Subst}\left(\int \left(\frac{2a}{\left(1+a^2\right)(a-x)} + \frac{-1+a^2+2ax}{\left(1+a^2\right)\left(1+x^2\right)}\right)dx, x, a+bx\right)}{2\left(1+a^2\right)} \\
&= \frac{b}{2\left(1+a^2\right)x} - \frac{\cot^{-1}(a+bx)}{2x^2} + \frac{ab^2\log(x)}{\left(1+a^2\right)^2} - \frac{b^2\,\mathrm{Subst}\left(\int \frac{-1+a^2+2ax}{1+x^2}\,dx, x, a+bx\right)}{2\left(1+a^2\right)^2} \\
&= \frac{b}{2\left(1+a^2\right)x} - \frac{\cot^{-1}(a+bx)}{2x^2} + \frac{ab^2\log(x)}{\left(1+a^2\right)^2} - \frac{\left(ab^2\right)\mathrm{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a+bx\right)}{\left(1+a^2\right)^2} + \frac{\left(\left(1-a^2\right)b^2\right)\mathrm{S}}{} \\
&= \frac{b}{2\left(1+a^2\right)x} - \frac{\cot^{-1}(a+bx)}{2x^2} + \frac{\left(1-a^2\right)b^2\tan^{-1}(a+bx)}{2\left(1+a^2\right)^2} + \frac{ab^2\log(x)}{\left(1+a^2\right)^2} - \frac{ab^2\log\left(1+(a+bx)^2\right)}{2\left(1+a^2\right)^2}
\end{aligned}
$$

<u>Mathematica</u> [C] time = 0.0928639, size = 92, normalized size = 0.97

$$
\frac{-2\cot^{-1}(a+bx) + \frac{bx\left(i(a+i)^2bx\log(-a-bx+i)+4abx\log(x)+(a-i)((-1-ia)bx\log(a+bx+i)+2(a+i))\right)}{\left(a^2+1\right)^2}}{4x^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/x^3,x]
```

```
[Out] (-2*ArcCot[a + b*x] + (b*x*(4*a*b*x*Log[x] + I*(I + a)^2*b*x*Log[I - a - b*
x] + (-I + a)*(2*(I + a) + (-1 - I*a)*b*x*Log[I + a + b*x])))/(1 + a^2)^2)/
(4*x^2)
```

Maple [A] time = 0.048, size = 104, normalized size = 1.1

$$-\frac{\operatorname{arccot}(bx+a)}{2x^{2}}-\frac{b^{2}\arctan(bx+a)a^{2}}{2(a^{2}+1)^{2}}-\frac{ab^{2}\ln\left(1+(bx+a)^{2}\right)}{2(a^{2}+1)^{2}}+\frac{b^{2}\arctan(bx+a)}{2(a^{2}+1)^{2}}+\frac{b}{(2a^{2}+2)x}+\frac{ab^{2}\ln(bx)}{(a^{2}+1)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/x^3,x)
```

```
[Out] -1/2*arccot(b*x+a)/x^2-1/2*b^2/(a^2+1)^2*arctan(b*x+a)*a^2-1/2*a*b^2*ln(1+(
b*x+a)^2)/(a^2+1)^2+1/2*b^2/(a^2+1)^2*arctan(b*x+a)+1/2*b/(a^2+1)/x+b^2/(a^
2+1)^2*a*ln(b*x)
```

Maxima [A] time = 1.47359, size = 151, normalized size = 1.59

$$-\frac{1}{2}\left(\frac{(a^{2}-1)b\arctan\left(\frac{b^{2}x+ab}{b}\right)}{a^{4}+2a^{2}+1}+\frac{ab\log\left(b^{2}x^{2}+2abx+a^{2}+1\right)}{a^{4}+2a^{2}+1}-\frac{2ab\log(x)}{a^{4}+2a^{2}+1}-\frac{1}{(a^{2}+1)x}\right)b-\frac{\operatorname{arccot}(bx+a)}{2x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*((a^2 - 1)*b*arctan((b^2*x + a*b)/b)/(a^4 + 2*a^2 + 1) + a*b*log(b^2*x
^2 + 2*a*b*x + a^2 + 1)/(a^4 + 2*a^2 + 1) - 2*a*b*log(x)/(a^4 + 2*a^2 + 1)
- 1/((a^2 + 1)*x))*b - 1/2*arccot(b*x + a)/x^2
```

Fricas [A] time = 2.30524, size = 248, normalized size = 2.61

$$-\frac{(a^{2}-1)b^{2}x^{2}\arctan(bx+a)+ab^{2}x^{2}\log\left(b^{2}x^{2}+2abx+a^{2}+1\right)-2ab^{2}x^{2}\log(x)-(a^{2}+1)bx+(a^{4}+2a^{2}+1)\operatorname{arccot}}{2(a^{4}+2a^{2}+1)x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^3,x, algorithm="fricas")
```

```
[Out] -1/2*((a^2 - 1)*b^2*x^2*arctan(b*x + a) + a*b^2*x^2*log(b^2*x^2 + 2*a*b*x +
 a^2 + 1) - 2*a*b^2*x^2*log(x) - (a^2 + 1)*b*x + (a^4 + 2*a^2 + 1)*arccot(b
```

```
*x + a))/((a^4 + 2*a^2 + 1)*x^2)
```

Sympy [B] time = 15.2081, size = 675, normalized size = 7.11

$$\begin{cases} -\frac{2b^3x^3\,\mathrm{acot}\,(bx-i)}{16bx^3-32ix^2} - \frac{ib^3x^3}{16bx^3-32ix^2} + \frac{4ib^2x^2\,\mathrm{acot}\,(bx-i)}{16bx^3-32ix^2} - \frac{8bx\,\mathrm{acot}\,(bx-i)}{16bx^3-32ix^2} - \frac{2ibx}{16bx^3-32ix^2} + \frac{16i\,\mathrm{acot}\,(bx-i)}{16bx^3-32ix^2} + \frac{4}{16bx^3-32ix^2} \\ -\frac{2b^3x^3\,\mathrm{acot}\,(bx+i)}{16bx^3+32ix^2} + \frac{ib^3x^3}{16bx^3+32ix^2} - \frac{4ib^2x^2\,\mathrm{acot}\,(bx+i)}{16bx^3+32ix^2} - \frac{8bx\,\mathrm{acot}\,(bx+i)}{16bx^3+32ix^2} + \frac{2ibx}{16bx^3+32ix^2} - \frac{16i\,\mathrm{acot}\,(bx+i)}{16bx^3+32ix^2} + \frac{4}{16bx^3+32ix^2} \\ -\frac{a^4\,\mathrm{acot}\,(a+bx)}{2a^4x^2+4a^2x^2+2x^2} + \frac{a^2b^2x^2\,\mathrm{acot}\,(a+bx)}{2a^4x^2+4a^2x^2+2x^2} + \frac{a^2bx}{2a^4x^2+4a^2x^2+2x^2} - \frac{2a^2\,\mathrm{acot}\,(a+bx)}{2a^4x^2+4a^2x^2+2x^2} + \frac{2ab^2x^2\log(x)}{2a^4x^2+4a^2x^2+2x^2} - \frac{ab^2x^2\log\left(a^2+2abx+b^2x^2+1\right)}{2a^4x^2+4a^2x^2+2x^2} - \frac{2}{2a^4x^2+} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/x**3,x)
```

```
[Out] Piecewise((-2*b**3*x**3*acot(b*x - I)/(16*b*x**3 - 32*I*x**2) - I*b**3*x**3
/(16*b*x**3 - 32*I*x**2) + 4*I*b**2*x**2*acot(b*x - I)/(16*b*x**3 - 32*I*x*
*2) - 8*b*x*acot(b*x - I)/(16*b*x**3 - 32*I*x**2) - 2*I*b*x/(16*b*x**3 - 32
*I*x**2) + 16*I*acot(b*x - I)/(16*b*x**3 - 32*I*x**2) + 4/(16*b*x**3 - 32*I
*x**2), Eq(a, -I)), (-2*b**3*x**3*acot(b*x + I)/(16*b*x**3 + 32*I*x**2) + I
*b**3*x**3/(16*b*x**3 + 32*I*x**2) - 4*I*b**2*x**2*acot(b*x + I)/(16*b*x**3
 + 32*I*x**2) - 8*b*x*acot(b*x + I)/(16*b*x**3 + 32*I*x**2) + 2*I*b*x/(16*b
*x**3 + 32*I*x**2) - 16*I*acot(b*x + I)/(16*b*x**3 + 32*I*x**2) + 4/(16*b*x
**3 + 32*I*x**2), Eq(a, I)), (-a**4*acot(a + b*x)/(2*a**4*x**2 + 4*a**2*x**
2 + 2*x**2) + a**2*b**2*x**2*acot(a + b*x)/(2*a**4*x**2 + 4*a**2*x**2 + 2*x
**2) + a**2*b*x/(2*a**4*x**2 + 4*a**2*x**2 + 2*x**2) - 2*a**2*acot(a + b*x)
/(2*a**4*x**2 + 4*a**2*x**2 + 2*x**2) + 2*a*b**2*x**2*log(x)/(2*a**4*x**2 +
 4*a**2*x**2 + 2*x**2) - a*b**2*x**2*log(a**2 + 2*a*b*x + b**2*x**2 + 1)/(2
*a**4*x**2 + 4*a**2*x**2 + 2*x**2) - 2*a*b**2*x**2/(2*a**4*x**2 + 4*a**2*x*
*2 + 2*x**2) - b**2*x**2*acot(a + b*x)/(2*a**4*x**2 + 4*a**2*x**2 + 2*x**2)
 + b*x/(2*a**4*x**2 + 4*a**2*x**2 + 2*x**2) - acot(a + b*x)/(2*a**4*x**2 +
4*a**2*x**2 + 2*x**2), True))
```

Giac [A] time = 1.11415, size = 158, normalized size = 1.66

$$-\frac{1}{2}\left(\frac{ab\log\left(b^2x^2+2\,abx+a^2+1\right)}{a^4+2\,a^2+1} - \frac{2\,ab\log\left(|x|\right)}{a^4+2\,a^2+1} + \frac{\left(a^2b^2-b^2\right)\arctan\left(bx+a\right)}{\left(a^4+2\,a^2+1\right)b} - \frac{1}{\left(a^2+1\right)x}\right)b - \frac{\arctan\left(\frac{1}{bx+a}\right)}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^3,x, algorithm="giac")
```

```
[Out] -1/2*(a*b*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/(a^4 + 2*a^2 + 1) - 2*a*b*log(ab
s(x))/(a^4 + 2*a^2 + 1) + (a^2*b^2 - b^2)*arctan(b*x + a)/((a^4 + 2*a^2 + 1
)*b) - 1/((a^2 + 1)*x))*b - 1/2*arctan(1/(b*x + a))/x^2
```

3.106 $\int \frac{\cot^{-1}(a+bx)}{x^4}\,dx$

Optimal. Leaf size=129

$$-\frac{2ab^2}{3\left(a^2+1\right)^2 x}+\frac{\left(1-3a^2\right)b^3\log(x)}{3\left(a^2+1\right)^3}-\frac{\left(1-3a^2\right)b^3\log\left((a+bx)^2+1\right)}{6\left(a^2+1\right)^3}-\frac{a\left(3-a^2\right)b^3\tan^{-1}(a+bx)}{3\left(a^2+1\right)^3}+\frac{b}{6\left(a^2+1\right)x^2}-$$

```
[Out] b/(6*(1 + a^2)*x^2) - (2*a*b^2)/(3*(1 + a^2)^2*x) - ArcCot[a + b*x]/(3*x^3)
 - (a*(3 - a^2)*b^3*ArcTan[a + b*x])/(3*(1 + a^2)^3) + ((1 - 3*a^2)*b^3*Log
[x])/(3*(1 + a^2)^3) - ((1 - 3*a^2)*b^3*Log[1 + (a + b*x)^2])/(6*(1 + a^2)^
3)
```

Rubi [A] time = 0.111787, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {5046, 371, 710, 801, 635, 203, 260}

$$-\frac{2ab^2}{3\left(a^2+1\right)^2 x}+\frac{\left(1-3a^2\right)b^3\log(x)}{3\left(a^2+1\right)^3}-\frac{\left(1-3a^2\right)b^3\log\left((a+bx)^2+1\right)}{6\left(a^2+1\right)^3}-\frac{a\left(3-a^2\right)b^3\tan^{-1}(a+bx)}{3\left(a^2+1\right)^3}+\frac{b}{6\left(a^2+1\right)x^2}-$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/x^4,x]
```

```
[Out] b/(6*(1 + a^2)*x^2) - (2*a*b^2)/(3*(1 + a^2)^2*x) - ArcCot[a + b*x]/(3*x^3)
 - (a*(3 - a^2)*b^3*ArcTan[a + b*x])/(3*(1 + a^2)^3) + ((1 - 3*a^2)*b^3*Log
[x])/(3*(1 + a^2)^3) - ((1 - 3*a^2)*b^3*Log[1 + (a + b*x)^2])/(6*(1 + a^2)^
3)
```

Rule 5046

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
 + d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 371

```
Int[((a_) + (b_.)*(v_)^(n_))^(p_.)*(x_)^(m_.), x_Symbol] :> With[{c = Coeff
icient[v, x, 0], d = Coefficient[v, x, 1]}, Dist[1/d^(m + 1), Subst[Int[Sim
```

```
plifyIntegrand[(x - c)^m*(a + b*x^n)^p, x], x], x, v], x] /; NeQ[c, 0]] /;
FreeQ[{a, b, n, p}, x] && LinearQ[v, x] && IntegerQ[m]
```

Rule 710

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Simp[(e*(d
 + e*x)^(m + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + Dist[c/(c*d^2 + a*e^2), In
t[((d + e*x)^(m + 1)*(d - e*x))/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e, m
}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[m, -1]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{x^4}\,dx = -\frac{\cot^{-1}(a+bx)}{3x^3} - \frac{1}{3}b\int \frac{1}{x^3\left(1+(a+bx)^2\right)}\,dx$$

$$= -\frac{\cot^{-1}(a+bx)}{3x^3} - \frac{1}{3}b^3\,\mathrm{Subst}\left(\int \frac{1}{(-a+x)^3\left(1+x^2\right)}\,dx, x, a+bx\right)$$

$$= \frac{b}{6\left(1+a^2\right)x^2} - \frac{\cot^{-1}(a+bx)}{3x^3} - \frac{b^3\,\mathrm{Subst}\left(\int \frac{-a-x}{(-a+x)^2\left(1+x^2\right)}\,dx, x, a+bx\right)}{3\left(1+a^2\right)}$$

$$= \frac{b}{6\left(1+a^2\right)x^2} - \frac{\cot^{-1}(a+bx)}{3x^3} - \frac{b^3\,\mathrm{Subst}\left(\int \left(-\frac{2a}{\left(1+a^2\right)(a-x)^2} + \frac{1-3a^2}{\left(1+a^2\right)^2(a-x)} + \frac{a\left(3-a^2\right)+\left(1-3a^2\right)x}{\left(1+a^2\right)^2\left(1+x^2\right)}\right)dx, x\right.}{3\left(1+a^2\right)}$$

$$= \frac{b}{6\left(1+a^2\right)x^2} - \frac{2ab^2}{3\left(1+a^2\right)^2x} - \frac{\cot^{-1}(a+bx)}{3x^3} + \frac{\left(1-3a^2\right)b^3\log(x)}{3\left(1+a^2\right)^3} - \frac{b^3\,\mathrm{Subst}\left(\int \frac{a\left(3-a^2\right)+\left(1-3a^2\right)}{1+x^2}\right.}{3\left(1+a^2\right)^3}$$

$$= \frac{b}{6\left(1+a^2\right)x^2} - \frac{2ab^2}{3\left(1+a^2\right)^2x} - \frac{\cot^{-1}(a+bx)}{3x^3} + \frac{\left(1-3a^2\right)b^3\log(x)}{3\left(1+a^2\right)^3} - \frac{\left(\left(1-3a^2\right)b^3\right)\mathrm{Subst}\left(\int \frac{x}{1+}\right.}{3\left(1+a^2\right)^3}$$

$$= \frac{b}{6\left(1+a^2\right)x^2} - \frac{2ab^2}{3\left(1+a^2\right)^2x} - \frac{\cot^{-1}(a+bx)}{3x^3} - \frac{a\left(3-a^2\right)b^3\tan^{-1}(a+bx)}{3\left(1+a^2\right)^3} + \frac{\left(1-3a^2\right)b^3\log(x)}{3\left(1+a^2\right)^3}$$

Mathematica [C] time = 0.131685, size = 126, normalized size = 0.98

$$\frac{2\left(1-3a^2\right)b^3x^3\log(x) + (a-i)bx\left((a+i)\left(a^2-4abx+1\right) + i(a-i)^2b^2x^2\log(a+bx+i)\right) - 2\left(a^2+1\right)^3\cot^{-1}(a+bx) + }{6\left(a^2+1\right)^3x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/x^4,x]
```

```
[Out] (-2*(1 + a^2)^3*ArcCot[a + b*x] + 2*(1 - 3*a^2)*b^3*x^3*Log[x] + (-1 + I*a)
^3*b^3*x^3*Log[I - a - b*x] + (-I + a)*b*x*((I + a)*(1 + a^2 - 4*a*b*x) + I
*(-I + a)^2*b^2*x^2*Log[I + a + b*x]))/(6*(1 + a^2)^3*x^3)
```

Maple [A] time = 0.053, size = 164, normalized size = 1.3

$$-\frac{\operatorname{arccot}(bx+a)}{3x^3}+\frac{b^3\ln\left(1+(bx+a)^2\right)a^2}{2\left(a^2+1\right)^3}-\frac{b^3\ln\left(1+(bx+a)^2\right)}{6\left(a^2+1\right)^3}+\frac{b^3\arctan(bx+a)\,a^3}{3\left(a^2+1\right)^3}-\frac{b^3\arctan(bx+a)\,a}{\left(a^2+1\right)^3}+\frac{}{(6a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/x^4,x)
```

```
[Out] -1/3*arccot(b*x+a)/x^3+1/2*b^3/(a^2+1)^3*ln(1+(b*x+a)^2)*a^2-1/6*b^3/(a^2+1
)^3*ln(1+(b*x+a)^2)+1/3*b^3/(a^2+1)^3*arctan(b*x+a)*a^3-b^3/(a^2+1)^3*arcta
n(b*x+a)*a+1/6*b/(a^2+1)/x^2-b^3/(a^2+1)^3*ln(b*x)*a^2+1/3*b^3/(a^2+1)^3*ln
(b*x)-2/3*a*b^2/(a^2+1)^2/x
```

Maxima [A] time = 1.48873, size = 223, normalized size = 1.73

$$\frac{1}{6}\left(\frac{2\left(a^3-3a\right)b^2\arctan\left(\frac{b^2x+ab}{b}\right)}{a^6+3a^4+3a^2+1}+\frac{\left(3a^2-1\right)b^2\log\left(b^2x^2+2abx+a^2+1\right)}{a^6+3a^4+3a^2+1}-\frac{2\left(3a^2-1\right)b^2\log(x)}{a^6+3a^4+3a^2+1}-\frac{4abx-a^2-1}{\left(a^4+2a^2+1\right)x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^4,x, algorithm="maxima")
```

```
[Out] 1/6*(2*(a^3 - 3*a)*b^2*arctan((b^2*x + a*b)/b)/(a^6 + 3*a^4 + 3*a^2 + 1) +
(3*a^2 - 1)*b^2*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/(a^6 + 3*a^4 + 3*a^2 + 1)
- 2*(3*a^2 - 1)*b^2*log(x)/(a^6 + 3*a^4 + 3*a^2 + 1) - (4*a*b*x - a^2 - 1)/
((a^4 + 2*a^2 + 1)*x^2))*b - 1/3*arccot(b*x + a)/x^3
```

Fricas [A] time = 2.40332, size = 344, normalized size = 2.67

$$\frac{2\left(a^3-3a\right)b^3x^3\arctan(bx+a)+\left(3a^2-1\right)b^3x^3\log\left(b^2x^2+2abx+a^2+1\right)-2\left(3a^2-1\right)b^3x^3\log(x)-4\left(a^3+a\right)b^2x^2+}{6\left(a^6+3a^4+3a^2+1\right)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^4,x, algorithm="fricas")
```

```
[Out] 1/6*(2*(a^3 - 3*a)*b^3*x^3*arctan(b*x + a) + (3*a^2 - 1)*b^3*x^3*log(b^2*x^
2 + 2*a*b*x + a^2 + 1) - 2*(3*a^2 - 1)*b^3*x^3*log(x) - 4*(a^3 + a)*b^2*x^2
 + (a^4 + 2*a^2 + 1)*b*x - 2*(a^6 + 3*a^4 + 3*a^2 + 1)*arccot(b*x + a))/((a
^6 + 3*a^4 + 3*a^2 + 1)*x^3)
```

Sympy [B] time = 33.0395, size = 1125, normalized size = 8.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/x**4,x)
```

```
[Out] Piecewise((3*I*b**4*x**4*acot(b*x - I)/(72*b*x**4 - 144*I*x**3) + 6*b**3*x*
*3*acot(b*x - I)/(72*b*x**4 - 144*I*x**3) - 3*I*b**3*x**3/(72*b*x**4 - 144*
I*x**3) - 3*b**2*x**2/(72*b*x**4 - 144*I*x**3) - 24*b*x*acot(b*x - I)/(72*b
*x**4 - 144*I*x**3) - 2*I*b*x/(72*b*x**4 - 144*I*x**3) + 48*I*acot(b*x - I)
/(72*b*x**4 - 144*I*x**3) + 8/(72*b*x**4 - 144*I*x**3), Eq(a, -I)), (-3*I*b
**4*x**4*acot(b*x + I)/(72*b*x**4 + 144*I*x**3) + 6*b**3*x**3*acot(b*x + I)
/(72*b*x**4 + 144*I*x**3) + 3*I*b**3*x**3/(72*b*x**4 + 144*I*x**3) - 3*b**2
*x**2/(72*b*x**4 + 144*I*x**3) - 24*b*x*acot(b*x + I)/(72*b*x**4 + 144*I*x*
*3) + 2*I*b*x/(72*b*x**4 + 144*I*x**3) - 48*I*acot(b*x + I)/(72*b*x**4 + 14
4*I*x**3) + 8/(72*b*x**4 + 144*I*x**3), Eq(a, I)), (-2*a**6*acot(a + b*x)/(
6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3) + a**4*b*x/(6*a**6*x**3
 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3) - 6*a**4*acot(a + b*x)/(6*a**6*x**
3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3) - 2*a**3*b**3*x**3*acot(a + b*x)/
(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3) - 4*a**3*b**2*x**2/(6*
a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3) - 6*a**2*b**3*x**3*log(x)
/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3) + 3*a**2*b**3*x**3*lo
g(a**2 + 2*a*b*x + b**2*x**2 + 1)/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**
3 + 6*x**3) + 7*a**2*b**3*x**3/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 +
 6*x**3) + 2*a**2*b*x/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3)
- 6*a**2*acot(a + b*x)/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3)
 + 6*a*b**3*x**3*acot(a + b*x)/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 +
 6*x**3) - 4*a*b**2*x**2/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**
3) + 2*b**3*x**3*log(x)/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3
) - b**3*x**3*log(a**2 + 2*a*b*x + b**2*x**2 + 1)/(6*a**6*x**3 + 18*a**4*x*
*3 + 18*a**2*x**3 + 6*x**3) - b**3*x**3/(6*a**6*x**3 + 18*a**4*x**3 + 18*a*
*2*x**3 + 6*x**3) + b*x/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3
) - 2*acot(a + b*x)/(6*a**6*x**3 + 18*a**4*x**3 + 18*a**2*x**3 + 6*x**3), T
rue))
```

Giac [A] time = 1.13441, size = 242, normalized size = 1.88

$$\frac{1}{6}\,b\left(\frac{\left(3\,a^2b^2-b^2\right)\log\left(b^2x^2+2\,abx+a^2+1\right)}{a^6+3\,a^4+3\,a^2+1}-\frac{2\left(3\,a^2b^2-b^2\right)\log\left(|x|\right)}{a^6+3\,a^4+3\,a^2+1}+\frac{2\left(a^3b^3-3\,ab^3\right)\arctan\left(bx+a\right)}{\left(a^6+3\,a^4+3\,a^2+1\right)b}+\frac{a^4+2\,a^2-\cdots}{\left(a^2\cdots\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/x^4,x, algorithm="giac")
```

```
[Out] 1/6*b*((3*a^2*b^2 - b^2)*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/(a^6 + 3*a^4 + 3*
a^2 + 1) - 2*(3*a^2*b^2 - b^2)*log(abs(x))/(a^6 + 3*a^4 + 3*a^2 + 1) + 2*(a
^3*b^3 - 3*a*b^3)*arctan(b*x + a)/((a^6 + 3*a^4 + 3*a^2 + 1)*b) + (a^4 + 2*
a^2 - 4*(a^3*b + a*b)*x + 1)/((a^2 + 1)^3*x^2)) - 1/3*arctan(1/(b*x + a))/x
^3
```

3.107 $\int \frac{\cot^{-1}(a+bx)}{c+dx^2}\,dx$

Optimal. Leaf size=642

$$\frac{\text{PolyLog}\left(2,-\frac{(-a-bx+i)\left(b\sqrt{c}-ia\sqrt{d}\right)}{(a+bx)\left(b\sqrt{c}-(1+ia)\sqrt{d}\right)}\right)}{4\sqrt{c}\sqrt{d}}-\frac{\text{PolyLog}\left(2,-\frac{(-a-bx+i)\left(b\sqrt{c}+ia\sqrt{d}\right)}{(a+bx)\left(b\sqrt{c}+(1+ia)\sqrt{d}\right)}\right)}{4\sqrt{c}\sqrt{d}}-\frac{\text{PolyLog}\left(2,\frac{(a+bx+i)\left(b\sqrt{c}-ia\sqrt{d}\right)}{(a+bx)\left(b\sqrt{c}+(1-ia)\sqrt{d}\right)}\right)}{4\sqrt{c}\sqrt{d}}+\frac{\text{PolyLog}}{}$$

```
[Out] -(Log[(I + a + b*x)/(a + b*x)]*Log[-((b*(I*Sqrt[c] - Sqrt[d]*x))/((b*Sqrt[c
] + (1 - I*a)*Sqrt[d])*(a + b*x)))])/(4*Sqrt[c]*Sqrt[d]) + (Log[-((I - a -
b*x)/(a + b*x))]*Log[(I*b*(Sqrt[c] + I*Sqrt[d]*x))/((b*Sqrt[c] - (1 + I*a)*
Sqrt[d])*(a + b*x))])/(4*Sqrt[c]*Sqrt[d]) - (Log[-((I - a - b*x)/(a + b*x))
]*Log[(b*(I*Sqrt[c] + Sqrt[d]*x))/((b*Sqrt[c] + (1 + I*a)*Sqrt[d])*(a + b*x
))])/(4*Sqrt[c]*Sqrt[d]) + (Log[(I + a + b*x)/(a + b*x)]*Log[-((b*(I*Sqrt[c
] + Sqrt[d]*x))/((b*Sqrt[c] + I*(I + a)*Sqrt[d])*(a + b*x)))])/(4*Sqrt[c]*S
qrt[d]) + PolyLog[2, -(((b*Sqrt[c] - I*a*Sqrt[d])*(I - a - b*x))/((b*Sqrt[c
] - (1 + I*a)*Sqrt[d])*(a + b*x)))]/(4*Sqrt[c]*Sqrt[d]) - PolyLog[2, -(((b*
Sqrt[c] + I*a*Sqrt[d])*(I - a - b*x))/((b*Sqrt[c] + (1 + I*a)*Sqrt[d])*(a +
 b*x)))]/(4*Sqrt[c]*Sqrt[d]) - PolyLog[2, ((b*Sqrt[c] - I*a*Sqrt[d])*(I + a
 + b*x))/((b*Sqrt[c] + (1 - I*a)*Sqrt[d])*(a + b*x))]/(4*Sqrt[c]*Sqrt[d]) +
 PolyLog[2, ((b*Sqrt[c] + I*a*Sqrt[d])*(I + a + b*x))/((b*Sqrt[c] + I*(I +
a)*Sqrt[d])*(a + b*x))]/(4*Sqrt[c]*Sqrt[d])
```

Rubi [A] time = 0.997957, antiderivative size = 655, normalized size of antiderivative = 1.02, number of steps used = 37, number of rules used = 7, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.438, Rules used = {5052, 2513, 2409, 2394, 2393, 2391, 205}

$$\frac{i\text{PolyLog}\left(2,-\frac{\sqrt{d}(-a-bx+i)}{b\sqrt{-c}-(-a+i)\sqrt{d}}\right)}{4\sqrt{-c}\sqrt{d}}-\frac{i\text{PolyLog}\left(2,\frac{\sqrt{d}(-a-bx+i)}{b\sqrt{-c}+(-a+i)\sqrt{d}}\right)}{4\sqrt{-c}\sqrt{d}}+\frac{i\text{PolyLog}\left(2,-\frac{\sqrt{d}(a+bx+i)}{b\sqrt{-c}-(a+i)\sqrt{d}}\right)}{4\sqrt{-c}\sqrt{d}}-\frac{i\text{PolyLog}\left(2,\frac{\sqrt{d}(a+bx+i)}{b\sqrt{-c}+(a+i)\sqrt{d}}\right)}{4\sqrt{-c}\sqrt{d}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[ArcCot[a + b*x]/(c + d*x^2),x]
```

```
[Out] ((I/2)*ArcTan[(Sqrt[d]*x)/Sqrt[c]]*(Log[-((I - a - b*x)/(a + b*x))] + Log[a
 + b*x] - Log[-I + a + b*x]))/(Sqrt[c]*Sqrt[d]) - ((I/2)*ArcTan[(Sqrt[d]*x)
/Sqrt[c]]*(Log[a + b*x] - Log[I + a + b*x] + Log[(I + a + b*x)/(a + b*x)]))
/(Sqrt[c]*Sqrt[d]) + ((I/4)*Log[-I + a + b*x]*Log[(b*(Sqrt[-c] - Sqrt[d]*x)
)/(b*Sqrt[-c] - (I - a)*Sqrt[d])])/(Sqrt[-c]*Sqrt[d]) - ((I/4)*Log[I + a +
b*x]*Log[(b*(Sqrt[-c] - Sqrt[d]*x))/(b*Sqrt[-c] + (I + a)*Sqrt[d])])/(Sqrt[
```

```
-c]*Sqrt[d]) - ((I/4)*Log[-I + a + b*x]*Log[(b*(Sqrt[-c] + Sqrt[d]*x))/(b*S
qrt[-c] + (I - a)*Sqrt[d])])/(Sqrt[-c]*Sqrt[d]) + ((I/4)*Log[I + a + b*x]*L
og[(b*(Sqrt[-c] + Sqrt[d]*x))/(b*Sqrt[-c] - (I + a)*Sqrt[d])])/(Sqrt[-c]*Sq
rt[d]) + ((I/4)*PolyLog[2, -((Sqrt[d]*(I - a - b*x))/(b*Sqrt[-c] - (I - a)*
Sqrt[d]))])/(Sqrt[-c]*Sqrt[d]) - ((I/4)*PolyLog[2, (Sqrt[d]*(I - a - b*x))/
(b*Sqrt[-c] + (I - a)*Sqrt[d])])/(Sqrt[-c]*Sqrt[d]) + ((I/4)*PolyLog[2, -((
Sqrt[d]*(I + a + b*x))/(b*Sqrt[-c] - (I + a)*Sqrt[d]))])/(Sqrt[-c]*Sqrt[d])
 - ((I/4)*PolyLog[2, (Sqrt[d]*(I + a + b*x))/(b*Sqrt[-c] + (I + a)*Sqrt[d])
])/(Sqrt[-c]*Sqrt[d])
```

<u>Rule 5052</u>

```
Int[ArcCot[(a_) + (b_.)*(x_)]/((c_) + (d_.)*(x_)^(n_.)), x_Symbol] :> Dist[
I/2, Int[Log[(-I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] - Dist[I/2, Int[
Log[(I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d}, x]
&& RationalQ[n]
```

<u>Rule 2513</u>

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]*(RFx_.), x_Symbol] :> Dist[p*r, Int[RFx*Log[a + b*x], x], x] + (Dis
t[q*r, Int[RFx*Log[c + d*x], x], x] - Dist[p*r*Log[a + b*x] + q*r*Log[c + d
*x] - Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r], Int[RFx, x], x]) /; FreeQ[{a, b
, c, d, e, f, p, q, r}, x] && RationalFunctionQ[RFx, x] && NeQ[b*c - a*d, 0
] &&  !MatchQ[RFx, (u_.)*(a + b*x)^(m_.)*(c + d*x)^(n_.) /; IntegersQ[m, n]
]
```

<u>Rule 2409</u>

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

<u>Rule 2394</u>

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

<u>Rule 2393</u>

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
```

```
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{c+dx^2}\,dx = \frac{1}{2}i\int \frac{\log\left(\frac{-i+a+bx}{a+bx}\right)}{c+dx^2}\,dx - \frac{1}{2}i\int \frac{\log\left(\frac{i+a+bx}{a+bx}\right)}{c+dx^2}\,dx$$

$$= \frac{1}{2}i\int \frac{\log(-i+a+bx)}{c+dx^2}\,dx - \frac{1}{2}i\int \frac{\log(i+a+bx)}{c+dx^2}\,dx - \frac{1}{2}\Big(i\Big(-\log(a+bx)+\log(-i+a+bx)-\text{l}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\Big(\log(a+bx)-\text{lo}}{2\sqrt{c}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\Big(\log(a+bx)-\text{lo}}{2\sqrt{c}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\Big(\log(a+bx)-\text{lo}}{2\sqrt{c}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\Big(\log(a+bx)-\text{lo}}{2\sqrt{c}}$$

$$= \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2\sqrt{c}\sqrt{d}} - \frac{i\tan^{-1}\left(\frac{\sqrt{d}x}{\sqrt{c}}\right)\Big(\log(a+bx)-\text{lo}}{2\sqrt{c}}$$

Mathematica [A] time = 0.548539, size = 563, normalized size = 0.88

$$-\frac{i\left(\text{PolyLog}\left(2,\frac{b(\sqrt{-c}-\sqrt{d}x)}{b\sqrt{-c}+(a-i)\sqrt{d}}\right)-\text{PolyLog}\left(2,\frac{b(\sqrt{-c}-\sqrt{d}x)}{b\sqrt{-c}+(a+i)\sqrt{d}}\right)-\text{PolyLog}\left(2,\frac{b(\sqrt{-c}+\sqrt{d}x)}{b\sqrt{-c}-(a-i)\sqrt{d}}\right)+\text{PolyLog}\left(2,\frac{b(\sqrt{-c}+\sqrt{d}x)}{b\sqrt{-c}-(a+i)\sqrt{d}}\right)+\text{lo}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/(c + d*x^2),x]
```

```
[Out] ((-I/4)*(Log[(Sqrt[d]*(-I + a + b*x))/(b*Sqrt[-c] + (-I + a)*Sqrt[d])]*Log[
Sqrt[-c] - Sqrt[d]*x] - Log[(-I + a + b*x)/(a + b*x)]*Log[Sqrt[-c] - Sqrt[d
]*x] - Log[(Sqrt[d]*(I + a + b*x))/(b*Sqrt[-c] + (I + a)*Sqrt[d])]*Log[Sqrt
[-c] - Sqrt[d]*x] + Log[(I + a + b*x)/(a + b*x)]*Log[Sqrt[-c] - Sqrt[d]*x]
- Log[-((Sqrt[d]*(-I + a + b*x))/(b*Sqrt[-c] - (-I + a)*Sqrt[d]))]*Log[Sqrt
[-c] + Sqrt[d]*x] + Log[(-I + a + b*x)/(a + b*x)]*Log[Sqrt[-c] + Sqrt[d]*x]
 + Log[-((Sqrt[d]*(I + a + b*x))/(b*Sqrt[-c] - (I + a)*Sqrt[d]))]*Log[Sqrt[
-c] + Sqrt[d]*x] - Log[(I + a + b*x)/(a + b*x)]*Log[Sqrt[-c] + Sqrt[d]*x] +
 PolyLog[2, (b*(Sqrt[-c] - Sqrt[d]*x))/(b*Sqrt[-c] + (-I + a)*Sqrt[d])] - P
olyLog[2, (b*(Sqrt[-c] - Sqrt[d]*x))/(b*Sqrt[-c] + (I + a)*Sqrt[d])] - Poly
Log[2, (b*(Sqrt[-c] + Sqrt[d]*x))/(b*Sqrt[-c] - (-I + a)*Sqrt[d])] + PolyLo
g[2, (b*(Sqrt[-c] + Sqrt[d]*x))/(b*Sqrt[-c] - (I + a)*Sqrt[d])]))/(Sqrt[-c]
*Sqrt[d])
```

Maple [B] time = 0.814, size = 2082, normalized size = 3.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(d*x^2+c),x)
```

```
[Out] -1/2*I/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d)*ln(1-(-2*I*a*d
+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d)
)*arccot(b*x+a)*a^2-1/2*I*b/d*(b^2*c*d)^(1/2)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2
)+d)*ln(1-(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2+2
*(b^2*c*d)^(1/2)+d))*arccot(b*x+a)-I*b/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d)*ln
(1-(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2+2*(b^2*c
*d)^(1/2)+d))*arccot(b*x+a)-I*b/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*ln(1-(-2*
I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/
2)+d))*arccot(b*x+a)+1/2*b/d*(b^2*c*d)^(1/2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)
```

```
+d)*arccot(b*x+a)^2-b/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2+1/2
/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2+1/2/
b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2*a^2+1
/4*b/d*(b^2*c*d)^(1/2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*
d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d
))-1/2*b/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*d+c*b^2-
d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d))+1/4/b*(b^2*
c*d)^(1/2)/c/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*d+c*
b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d))+1/4/b*(
b^2*c*d)^(1/2)/c/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*
d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d))*a^2
+1/2*I*b/d*(b^2*c*d)^(1/2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)*ln(1-(-2*I*a*d
+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)
)*arccot(b*x+a)+1/2*I/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2-2*(b^2*c*d)^(1/2)+d)
*ln(1-(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^2*d+c*b^2-2*(b^
2*c*d)^(1/2)+d))*arccot(b*x+a)+1/2*I/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2-2*(b^
2*c*d)^(1/2)+d)*ln(1-(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a^
2*d+c*b^2-2*(b^2*c*d)^(1/2)+d))*arccot(b*x+a)*a^2-1/2*I/b*(b^2*c*d)^(1/2)/c
/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d)*ln(1-(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^
2/(1+(b*x+a)^2)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d))*arccot(b*x+a)-1/2*b/d*(b
^2*c*d)^(1/2)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2-b/(a^2*d+c*
b^2+2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2-1/2/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b
^2+2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2-1/2/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^
2+2*(b^2*c*d)^(1/2)+d)*arccot(b*x+a)^2*a^2-1/4*b/d*(b^2*c*d)^(1/2)/(a^2*d+c
*b^2+2*(b^2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1
+(b*x+a)^2)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d))-1/2*b/(a^2*d+c*b^2+2*(b^2*c*
d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2)/(a
^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d))-1/4/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2+2*(b^
2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+a)^2
)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d))-1/4/b*(b^2*c*d)^(1/2)/c/(a^2*d+c*b^2+2
*(b^2*c*d)^(1/2)+d)*polylog(2,(-2*I*a*d+a^2*d+c*b^2-d)*(I+a+b*x)^2/(1+(b*x+
a)^2)/(a^2*d+c*b^2+2*(b^2*c*d)^(1/2)+d))*a^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(d*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(bx+a)}{dx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(d*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arccot(b*x + a)/(d*x^2 + c), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(d*x**2+c),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(d*x^2+c),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(d*x^2 + c), x)
```

3.108 $\int \frac{\cot^{-1}(a+bx)}{c+dx}\,dx$

Optimal. Leaf size=152

$$\frac{i\text{PolyLog}\left(2,1-\frac{2b(c+dx)}{(1-i(a+bx))(-ad+bc+id)}\right)}{2d}-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1-i(a+bx)}\right)}{2d}+\frac{\cot^{-1}(a+bx)\log\left(\frac{2b(c+dx)}{(1-i(a+bx))(-ad+bc+id)}\right)}{d}-\frac{\log\left(\frac{}{1-}\right.}{}$$

```
[Out] -((ArcCot[a + b*x]*Log[2/(1 - I*(a + b*x))])/d) + (ArcCot[a + b*x]*Log[(2*b
*(c + d*x))/((b*c + I*d - a*d)*(1 - I*(a + b*x)))])/d - ((I/2)*PolyLog[2, 1
 - 2/(1 - I*(a + b*x))])/d + ((I/2)*PolyLog[2, 1 - (2*b*(c + d*x))/((b*c +
I*d - a*d)*(1 - I*(a + b*x)))])/d
```

Rubi [A] time = 0.14161, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.357, Rules used = {5048, 4857, 2402, 2315, 2447}

$$\frac{i\text{PolyLog}\left(2,1-\frac{2b(c+dx)}{(1-i(a+bx))(-ad+bc+id)}\right)}{2d}-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1-i(a+bx)}\right)}{2d}+\frac{\cot^{-1}(a+bx)\log\left(\frac{2b(c+dx)}{(1-i(a+bx))(-ad+bc+id)}\right)}{d}-\frac{\log\left(\frac{}{1-}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/(c + d*x),x]
```


```
[Out] -((ArcCot[a + b*x]*Log[2/(1 - I*(a + b*x))])/d) + (ArcCot[a + b*x]*Log[(2*b
*(c + d*x))/((b*c + I*d - a*d)*(1 - I*(a + b*x)))])/d - ((I/2)*PolyLog[2, 1
 - 2/(1 - I*(a + b*x))])/d + ((I/2)*PolyLog[2, 1 - (2*b*(c + d*x))/((b*c +
I*d - a*d)*(1 - I*(a + b*x)))])/d
```


Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
```

```
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{c+dx}\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{\frac{bc-ad}{b}+\frac{dx}{b}}\,dx, x, a+bx\right)}{b}$$

$$= -\frac{\cot^{-1}(a+bx)\log\left(\frac{2}{1-i(a+bx)}\right)}{d} + \frac{\cot^{-1}(a+bx)\log\left(\frac{2b(c+dx)}{(bc+id-ad)(1-i(a+bx))}\right)}{d} - \frac{\text{Subst}\left(\int \frac{\log\left(\frac{2}{1-ix}\right)}{1+x^2}\,dx, x,\right.}{d}$$

$$= -\frac{\cot^{-1}(a+bx)\log\left(\frac{2}{1-i(a+bx)}\right)}{d} + \frac{\cot^{-1}(a+bx)\log\left(\frac{2b(c+dx)}{(bc+id-ad)(1-i(a+bx))}\right)}{d} + \frac{i\text{Li}_2\left(1-\frac{2b(c+dx)}{(bc+id-ad)(1-i(a+}\right.}{2d}$$

$$= -\frac{\cot^{-1}(a+bx)\log\left(\frac{2}{1-i(a+bx)}\right)}{d} + \frac{\cot^{-1}(a+bx)\log\left(\frac{2b(c+dx)}{(bc+id-ad)(1-i(a+bx))}\right)}{d} - \frac{i\text{Li}_2\left(1-\frac{2}{1-i(a+bx)}\right)}{2d} + \frac{iL}{}$$

Mathematica [B] time = 0.0399261, size = 345, normalized size = 2.27

$$\frac{i\text{PolyLog}\left(2,\frac{b\left(\frac{bc-ad}{b}+\frac{d(a+bx)}{b}\right)}{-ad+bc-id}\right)}{2d}-\frac{i\text{PolyLog}\left(2,\frac{b\left(\frac{bc-ad}{b}+\frac{d(a+bx)}{b}\right)}{-ad+bc+id}\right)}{2d}-\frac{i\log\left(\frac{d(a+bx-i)}{b\left(-\frac{bc-ad}{b}-\frac{id}{b}\right)}\right)\log\left(\frac{bc-ad}{b}+\frac{d(a+bx)}{b}\right)}{2d}+\frac{i\log\left(\frac{a+bx-i}{a+bx}\right)}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/(c + d*x),x]
```

```
[Out] ((-I/2)*Log[(d*(-I + a + b*x))/(b*(((-I)*d)/b - (b*c - a*d)/b))]*Log[(b*c -
 a*d)/b + (d*(a + b*x))/b])/d + ((I/2)*Log[(-I + a + b*x)/(a + b*x)]*Log[(b
*c - a*d)/b + (d*(a + b*x))/b])/d + ((I/2)*Log[(d*(I + a + b*x))/(b*((I*d)/
b - (b*c - a*d)/b))]*Log[(b*c - a*d)/b + (d*(a + b*x))/b])/d - ((I/2)*Log[(
I + a + b*x)/(a + b*x)]*Log[(b*c - a*d)/b + (d*(a + b*x))/b])/d + ((I/2)*Po
lyLog[2, (b*((b*c - a*d)/b + (d*(a + b*x))/b))/(b*c - I*d - a*d)])/d - ((I/
2)*PolyLog[2, (b*((b*c - a*d)/b + (d*(a + b*x))/b))/(b*c + I*d - a*d)])/d
```

Maple [A] time = 0.057, size = 198, normalized size = 1.3

$$\frac{\ln\left(d\left(bx+a\right)-ad+cb\right)\operatorname{arccot}\left(bx+a\right)}{d}-\frac{\frac{i}{2}\ln\left(d\left(bx+a\right)-ad+cb\right)}{d}\ln\left(\frac{id-d\left(bx+a\right)}{cb+id-ad}\right)+\frac{\frac{i}{2}\ln\left(d\left(bx+a\right)-ad+cb\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(d*x+c),x)
```

```
[Out] ln(d*(b*x+a)-a*d+c*b)/d*arccot(b*x+a)-1/2*I*ln(d*(b*x+a)-a*d+c*b)/d*ln((I*d
-d*(b*x+a))/(c*b+I*d-a*d))+1/2*I*ln(d*(b*x+a)-a*d+c*b)/d*ln((I*d+d*(b*x+a))
/(I*d+a*d-c*b))-1/2*I/d*dilog((I*d-d*(b*x+a))/(c*b+I*d-a*d))+1/2*I/d*dilog(
(I*d+d*(b*x+a))/(I*d+a*d-c*b))
```

Maxima [B] time = 1.89624, size = 382, normalized size = 2.51

$$\frac{\operatorname{arccot}\left(bx+a\right)\log\left(dx+c\right)}{d}+\frac{\arctan\left(\frac{b^2x+ab}{b}\right)\log\left(dx+c\right)}{d}+\frac{\arctan\left(\frac{bd^2x+bcd}{b^2c^2-2\,abcd+\left(a^2+1\right)d^2},\frac{b^2c^2-abcd+\left(b^2cd-abd^2\right)x}{b^2c^2-2\,abcd+\left(a^2+1\right)d^2}\right)\log\left(b^2x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(d*x+c),x, algorithm="maxima")
```

```
[Out] arccot(b*x + a)*log(d*x + c)/d + arctan((b^2*x + a*b)/b)*log(d*x + c)/d + 1
/2*(arctan2((b*d^2*x + b*c*d)/(b^2*c^2 - 2*a*b*c*d + (a^2 + 1)*d^2), (b^2*c
^2 - a*b*c*d + (b^2*c*d - a*b*d^2)*x)/(b^2*c^2 - 2*a*b*c*d + (a^2 + 1)*d^2)
)*log(b^2*x^2 + 2*a*b*x + a^2 + 1) - arctan(b*x + a)*log((b^2*d^2*x^2 + 2*b
^2*c*d*x + b^2*c^2)/(b^2*c^2 - 2*a*b*c*d + (a^2 + 1)*d^2)) + I*dilog((I*b*d
*x + (I*a + 1)*d)/(-I*b*c + (I*a + 1)*d)) - I*dilog((I*b*d*x + (I*a - 1)*d)
/(-I*b*c + (I*a - 1)*d)))/d
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(bx+a)}{dx+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(d*x+c),x, algorithm="fricas")
```

```
[Out] integral(arccot(b*x + a)/(d*x + c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(a+bx)}{c+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(d*x+c),x)
```

```
[Out] Integral(acot(a + b*x)/(c + d*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{dx+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(d*x+c),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(d*x + c), x)
```

3.109 $\int \frac{\cot^{-1}(a+bx)}{c+\frac{d}{x}}\,dx$

Optimal. Leaf size=338

$$-\frac{id\text{PolyLog}\left(2,-\frac{b(cx+d)}{-bd+(a+i)c}\right)}{2c^2}+\frac{id\text{PolyLog}\left(2,\frac{b(cx+d)}{-ac+bd+ic}\right)}{2c^2}+\frac{id\log(cx+d)\log\left(\frac{c(-a-bx+i)}{-ac+bd+ic}\right)}{2c^2}-\frac{id\log\left(-\frac{-a-bx+i}{a+bx}\right)\log(cx+d)}{2c^2}$$

```
[Out] Log[I - a - b*x]/(2*b*c) + ((I/2)*(a + b*x)*Log[-((I - a - b*x)/(a + b*x))]
)/(b*c) + Log[I + a + b*x]/(2*b*c) - ((I/2)*(a + b*x)*Log[(I + a + b*x)/(a
+ b*x)])/(b*c) + ((I/2)*d*Log[(c*(I - a - b*x))/(I*c - a*c + b*d)]*Log[d +
c*x])/c^2 - ((I/2)*d*Log[-((I - a - b*x)/(a + b*x))]*Log[d + c*x])/c^2 - ((
I/2)*d*Log[(c*(I + a + b*x))/((I + a)*c - b*d)]*Log[d + c*x])/c^2 + ((I/2)*
d*Log[(I + a + b*x)/(a + b*x)]*Log[d + c*x])/c^2 - ((I/2)*d*PolyLog[2, -((b
*(d + c*x))/((I + a)*c - b*d))])/c^2 + ((I/2)*d*PolyLog[2, (b*(d + c*x))/(I
*c - a*c + b*d)])/c^2
```

Rubi [A] time = 0.498225, antiderivative size = 422, normalized size of antiderivative = 1.25, number of steps used = 37, number of rules used = 10, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {5052, 2513, 2409, 2389, 2295, 2394, 2393, 2391, 193, 43}

$$-\frac{id\text{PolyLog}\left(2,\frac{c(-a-bx+i)}{bd+(-a+i)c}\right)}{2c^2}+\frac{id\text{PolyLog}\left(2,\frac{c(a+bx+i)}{-bd+(a+i)c}\right)}{2c^2}-\frac{id\left(\log\left(-\frac{-a-bx+i}{a+bx}\right)+\log(a+bx)-\log(a+bx-i)\right)\log(cx+d)}{2c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Int[ArcCot[a + b*x]/(c + d/x),x]
```

```
[Out] ((I/2)*x*(Log[-((I - a - b*x)/(a + b*x))] + Log[a + b*x] - Log[-I + a + b*x
]))/c - ((I/2)*(I - a - b*x)*Log[-I + a + b*x])/(b*c) - ((I/2)*(I + a + b*x
)*Log[I + a + b*x])/(b*c) - ((I/2)*x*(Log[a + b*x] - Log[I + a + b*x] + Log
[(I + a + b*x)/(a + b*x)]))/c - ((I/2)*d*(Log[-((I - a - b*x)/(a + b*x))] +
 Log[a + b*x] - Log[-I + a + b*x])*Log[d + c*x])/c^2 + ((I/2)*d*(Log[a + b*
x] - Log[I + a + b*x] + Log[(I + a + b*x)/(a + b*x)])*Log[d + c*x])/c^2 + (
(I/2)*d*Log[I + a + b*x]*Log[-((b*(d + c*x))/((I + a)*c - b*d))])/c^2 - ((I
/2)*d*Log[-I + a + b*x]*Log[(b*(d + c*x))/((I - a)*c + b*d)])/c^2 - ((I/2)*
d*PolyLog[2, (c*(I - a - b*x))/((I - a)*c + b*d)])/c^2 + ((I/2)*d*PolyLog[2
, (c*(I + a + b*x))/((I + a)*c - b*d)])/c^2
```

Rule 5052

```
Int[ArcCot[(a_) + (b_.)*(x_)]/((c_) + (d_.)*(x_)^(n_.)), x_Symbol] :> Dist[
I/2, Int[Log[(-I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] - Dist[I/2, Int[
Log[(I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d}, x]
&& RationalQ[n]
```

Rule 2513

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]*(RFx_.), x_Symbol] :> Dist[p*r, Int[RFx*Log[a + b*x], x], x] + (Dis
t[q*r, Int[RFx*Log[c + d*x], x], x] - Dist[p*r*Log[a + b*x] + q*r*Log[c + d
*x] - Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r], Int[RFx, x], x]) /; FreeQ[{a, b
, c, d, e, f, p, q, r}, x] && RationalFunctionQ[RFx, x] && NeQ[b*c - a*d, 0
] &&  !MatchQ[RFx, (u_.)*(a + b*x)^(m_.)*(c + d*x)^(n_.) /; IntegersQ[m, n]
]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 2389

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.), x_Symbol] :
> Dist[1/e, Subst[Int[(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a
, b, c, d, e, n, p}, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
```

```
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{c+\frac{d}{x}}\,dx = \frac{1}{2}i\int \frac{\log\left(\frac{-i+a+bx}{a+bx}\right)}{c+\frac{d}{x}}\,dx - \frac{1}{2}i\int \frac{\log\left(\frac{i+a+bx}{a+bx}\right)}{c+\frac{d}{x}}\,dx$$

$$= \frac{1}{2}i\int \frac{\log(-i+a+bx)}{c+\frac{d}{x}}\,dx - \frac{1}{2}i\int \frac{\log(i+a+bx)}{c+\frac{d}{x}}\,dx - \frac{1}{2}\left(i\left(-\log(a+bx)+\log(-i+a+bx)-\text{lo}\right.\right.$$

$$= \frac{1}{2}i\int \left(\frac{\log(-i+a+bx)}{c} - \frac{d\log(-i+a+bx)}{c(d+cx)}\right)dx - \frac{1}{2}i\int \left(\frac{\log(i+a+bx)}{c} - \frac{d\log(i+a+bx)}{c(d+cx)}\right)dx$$

$$= \frac{i\int \log(-i+a+bx)\,dx}{2c} - \frac{i\int \log(i+a+bx)\,dx}{2c} - \frac{(id)\int \frac{\log(-i+a+bx)}{d+cx}\,dx}{2c} + \frac{(id)\int \frac{\log(i+a+bx)}{d+cx}\,dx}{2c} - \frac{1}{2}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{ix\left(\log(a+bx)-\log(i+a+bx)+\log\left(\frac{i+a+}{a+b}\right.\right.}{2c}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i(i-a-bx)\log(-i+a+bx)}{2bc} - \frac{i(i+a+bx}{}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i(i-a-bx)\log(-i+a+bx)}{2bc} - \frac{i(i+a+bx}{}$$

Mathematica [A] time = 9.24453, size = 602, normalized size = 1.78

$$-\frac{\left((a+bx)^2+1\right)\left(-ibcd\text{PolyLog}\left(2,\exp\left(2i\left(\cot^{-1}(a+bx)-\tan^{-1}\left(\frac{c}{ac-bd}\right)\right)\right)\right)+ibcd\text{PolyLog}\left(2,e^{2i\cot^{-1}(a+bx)}\right)+abcd\cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/(c + d/x),x]
```

```
[Out] -((1 + (a + b*x)^2)*(I*b*c*d*Pi*ArcCot[a + b*x] - 2*c^2*(a + b*x)*ArcCot[a
+ b*x] + I*b*c*d*ArcCot[a + b*x]^2 - a*b*c*d*ArcCot[a + b*x]^2 + b^2*d^2*Ar
cCot[a + b*x]^2 + (a*b*c*d*Sqrt[((1 + a^2)*c^2 - 2*a*b*c*d + b^2*d^2)/(a*c
- b*d)^2]*ArcCot[a + b*x]^2)/E^(I*ArcTan[c/(a*c - b*d)]) - (b^2*d^2*Sqrt[((
1 + a^2)*c^2 - 2*a*b*c*d + b^2*d^2)/(a*c - b*d)^2]*ArcCot[a + b*x]^2)/E^(I*
ArcTan[c/(a*c - b*d)]) + (2*I)*b*c*d*ArcCot[a + b*x]*ArcTan[c/(a*c - b*d)]
+ b*c*d*Pi*Log[1 + E^((-2*I)*ArcCot[a + b*x])] - 2*b*c*d*ArcCot[a + b*x]*Lo
g[1 - E^((2*I)*ArcCot[a + b*x])] + 2*b*c*d*ArcCot[a + b*x]*Log[1 - E^((2*I)
*(ArcCot[a + b*x] - ArcTan[c/(a*c - b*d)]))] - 2*b*c*d*ArcTan[c/(a*c - b*d)
]*Log[1 - E^((2*I)*(ArcCot[a + b*x] - ArcTan[c/(a*c - b*d)]))] - b*c*d*Pi*L
og[1/Sqrt[1 + (a + b*x)^(-2)]] + 2*c^2*Log[1/((a + b*x)*Sqrt[1 + (a + b*x)^
(-2)])] + 2*b*c*d*ArcTan[c/(a*c - b*d)]*Log[Sin[ArcCot[a + b*x] - ArcTan[c/
(a*c - b*d)]]] + I*b*c*d*PolyLog[2, E^((2*I)*ArcCot[a + b*x])] - I*b*c*d*Po
lyLog[2, E^((2*I)*(ArcCot[a + b*x] - ArcTan[c/(a*c - b*d)]))]))/(2*b*c^3*(a
 + b*x)^2*Sqrt[(1 + a^2 + 2*a*b*x + b^2*x^2)/(a + b*x)^2]*Sqrt[1 + (a + b*x
)^(-2)])
```

Maple [A] time = 0.066, size = 317, normalized size = 0.9

$$\frac{x\operatorname{arccot}(bx+a)}{c}+\frac{\operatorname{arccot}(bx+a)\,a}{cb}-\frac{\operatorname{arccot}(bx+a)\,d\ln\left(c\,(bx+a)-ac+bd\right)}{c^2}+\frac{\ln\left(a^2c^2-2\,abcd+b^2d^2+2\,ac\,(c\,(\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(c+d/x),x)
```

```
[Out] arccot(b*x+a)/c*x+1/b*arccot(b*x+a)/c*a-arccot(b*x+a)*d/c^2*ln(c*(b*x+a)-a*
c+b*d)+1/2/b/c*ln(a^2*c^2-2*a*b*c*d+b^2*d^2+2*a*c*(c*(b*x+a)-a*c+b*d)-2*(c*
(b*x+a)-a*c+b*d)*b*d+(c*(b*x+a)-a*c+b*d)^2+c^2)+1/2*I/c^2*d*ln(c*(b*x+a)-a*
```

```
c+b*d)*ln((I*c-c*(b*x+a))/(I*c-a*c+b*d))-1/2*I/c^2*d*ln(c*(b*x+a)-a*c+b*d)*
ln((I*c+c*(b*x+a))/(I*c+a*c-b*d))+1/2*I/c^2*d*dilog((I*c-c*(b*x+a))/(I*c-a*
c+b*d))-1/2*I/c^2*d*dilog((I*c+c*(b*x+a))/(I*c+a*c-b*d))
```

Maxima [A] time = 1.87904, size = 378, normalized size = 1.12

$$\frac{2\,bcx\arctan\left(1,bx+a\right)-bd\arctan\left(1,bx+a\right)\log\left(-\frac{b^2c^2x^2+2\,b^2cdx+b^2d^2}{2\,abcd-b^2d^2-\left(a^2+1\right)c^2}\right)-2\,ac\arctan\left(bx+a\right)+i\,bd\mathrm{Li}_2\left(\frac{bcx+(a+i)c}{(a+i)c-bd}\right)-i\,b}{2\,bc^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x),x, algorithm="maxima")
```

```
[Out] 1/2*(2*b*c*x*arctan2(1, b*x + a) - b*d*arctan2(1, b*x + a)*log(-(b^2*c^2*x^
2 + 2*b^2*c*d*x + b^2*d^2)/(2*a*b*c*d - b^2*d^2 - (a^2 + 1)*c^2)) - 2*a*c*a
rctan(b*x + a) + I*b*d*dilog((b*c*x + (a + I)*c)/((a + I)*c - b*d)) - I*b*d
*dilog((b*c*x + (a - I)*c)/((a - I)*c - b*d)) - (b*d*arctan2(-(b*c^2*x + b*
c*d)/(2*a*b*c*d - b^2*d^2 - (a^2 + 1)*c^2), (a*b*c*d - b^2*d^2 + (a*b*c^2 -
 b^2*c*d)*x)/(2*a*b*c*d - b^2*d^2 - (a^2 + 1)*c^2)) - c)*log(b^2*x^2 + 2*a*
b*x + a^2 + 1))/(b*c^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x\,\mathrm{arccot}\left(bx+a\right)}{cx+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x),x, algorithm="fricas")
```

```
[Out] integral(x*arccot(b*x + a)/(c*x + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\,\mathrm{acot}\left(a+bx\right)}{cx+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(c+d/x),x)
```

```
[Out] Integral(x*acot(a + b*x)/(c*x + d), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{c+\frac{d}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(c + d/x), x)
```

3.110 $\int \frac{\cot^{-1}(a+bx)}{c+\frac{d}{x^2}}\,dx$

Optimal. Leaf size=735

$$-\frac{\sqrt{d}\operatorname{PolyLog}\left(2,\frac{b\left(\sqrt{d}-i\sqrt{c}x\right)}{b\sqrt{d}+(1+ia)\sqrt{c}}\right)}{4c^{3/2}}+\frac{\sqrt{d}\operatorname{PolyLog}\left(2,\frac{b\left(\sqrt{d}-i\sqrt{c}x\right)}{b\sqrt{d}+i(a+i)\sqrt{c}}\right)}{4c^{3/2}}+\frac{\sqrt{d}\operatorname{PolyLog}\left(2,-\frac{b\left(\sqrt{d}+i\sqrt{c}x\right)}{-b\sqrt{d}+(1+ia)\sqrt{c}}\right)}{4c^{3/2}}-\frac{\sqrt{d}\operatorname{PolyLog}\left(2,\frac{b(}{b\sqrt{d}}\right.}{4c^{3/2}}$$

```
[Out] Log[I - a - b*x]/(2*b*c) + ((I/2)*(a + b*x)*Log[-((I - a - b*x)/(a + b*x))]
)/(b*c) - ((I/2)*Sqrt[d]*ArcTan[(Sqrt[c]*x)/Sqrt[d]]*Log[-((I - a - b*x)/(a
 + b*x))])/c^(3/2) + Log[I + a + b*x]/(2*b*c) - ((I/2)*(a + b*x)*Log[(I + a
 + b*x)/(a + b*x)])/(b*c) + ((I/2)*Sqrt[d]*ArcTan[(Sqrt[c]*x)/Sqrt[d]]*Log[
(I + a + b*x)/(a + b*x)])/c^(3/2) - (Sqrt[d]*Log[(Sqrt[c]*(I - a - b*x))/((
I - a)*Sqrt[c] + I*b*Sqrt[d])]*Log[1 - (I*Sqrt[c]*x)/Sqrt[d]])/(4*c^(3/2))
+ (Sqrt[d]*Log[(Sqrt[c]*(I + a + b*x))/((I + a)*Sqrt[c] - I*b*Sqrt[d])]*Log
[1 - (I*Sqrt[c]*x)/Sqrt[d]])/(4*c^(3/2)) + (Sqrt[d]*Log[(Sqrt[c]*(I - a - b
*x))/((I - a)*Sqrt[c] - I*b*Sqrt[d])]*Log[1 + (I*Sqrt[c]*x)/Sqrt[d]])/(4*c^
(3/2)) - (Sqrt[d]*Log[(Sqrt[c]*(I + a + b*x))/((I + a)*Sqrt[c] + I*b*Sqrt[d
])]*Log[1 + (I*Sqrt[c]*x)/Sqrt[d]])/(4*c^(3/2)) - (Sqrt[d]*PolyLog[2, (b*(S
qrt[d] - I*Sqrt[c]*x))/((1 + I*a)*Sqrt[c] + b*Sqrt[d])])/(4*c^(3/2)) + (Sqr
t[d]*PolyLog[2, (b*(Sqrt[d] - I*Sqrt[c]*x))/(I*(I + a)*Sqrt[c] + b*Sqrt[d])
])/(4*c^(3/2)) + (Sqrt[d]*PolyLog[2, -((b*(Sqrt[d] + I*Sqrt[c]*x))/((1 + I*
a)*Sqrt[c] - b*Sqrt[d]))])/(4*c^(3/2)) - (Sqrt[d]*PolyLog[2, (b*(Sqrt[d] +
I*Sqrt[c]*x))/((1 - I*a)*Sqrt[c] + b*Sqrt[d])])/(4*c^(3/2))
```

Rubi [A] time = 1.51786, antiderivative size = 818, normalized size of antiderivative = 1.11, number of steps used = 57, number of rules used = 11, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.688, Rules used = {5052, 2513, 2409, 2389, 2295, 2394, 2393, 2391, 193, 321, 205}

$$\frac{ix\left(\log\left(-\frac{-a-bx+i}{a+bx}\right)+\log(a+bx)-\log(a+bx-i)\right)}{2c}-\frac{i\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c}x}{\sqrt{d}}\right)\left(\log\left(-\frac{-a-bx+i}{a+bx}\right)+\log(a+bx)-\log(a+bx-i)\right)}{2c^{3/2}}-$$

Warning: Unable to verify antiderivative.

```
[In] Int[ArcCot[a + b*x]/(c + d/x^2),x]
```

```
[Out] ((I/2)*x*(Log[-((I - a - b*x)/(a + b*x))] + Log[a + b*x] - Log[-I + a + b*x
]))/c - ((I/2)*Sqrt[d]*ArcTan[(Sqrt[c]*x)/Sqrt[d]]*(Log[-((I - a - b*x)/(a
+ b*x))] + Log[a + b*x] - Log[-I + a + b*x]))/c^(3/2) - ((I/2)*(I - a - b*x
```

```
)*Log[-I + a + b*x])/(b*c) - ((I/2)*(I + a + b*x)*Log[I + a + b*x])/(b*c) -
 ((I/2)*x*(Log[a + b*x] - Log[I + a + b*x] + Log[(I + a + b*x)/(a + b*x)]))
/c + ((I/2)*Sqrt[d]*ArcTan[(Sqrt[c]*x)/Sqrt[d]]*(Log[a + b*x] - Log[I + a +
 b*x] + Log[(I + a + b*x)/(a + b*x)]))/c^(3/2) - ((I/4)*Sqrt[d]*Log[-I + a
+ b*x]*Log[-((b*(Sqrt[d] - Sqrt[-c]*x))/((I - a)*Sqrt[-c] - b*Sqrt[d]))])/(
-c)^(3/2) + ((I/4)*Sqrt[d]*Log[I + a + b*x]*Log[(b*(Sqrt[d] - Sqrt[-c]*x))/
((I + a)*Sqrt[-c] + b*Sqrt[d])])/(-c)^(3/2) - ((I/4)*Sqrt[d]*Log[I + a + b*
x]*Log[-((b*(Sqrt[d] + Sqrt[-c]*x))/((I + a)*Sqrt[-c] - b*Sqrt[d]))])/(-c)^
(3/2) + ((I/4)*Sqrt[d]*Log[-I + a + b*x]*Log[(b*(Sqrt[d] + Sqrt[-c]*x))/((I
 - a)*Sqrt[-c] + b*Sqrt[d])])/(-c)^(3/2) - ((I/4)*Sqrt[d]*PolyLog[2, (Sqrt[
-c]*(I - a - b*x))/((I - a)*Sqrt[-c] - b*Sqrt[d])])/(-c)^(3/2) + ((I/4)*Sqr
t[d]*PolyLog[2, (Sqrt[-c]*(I - a - b*x))/((I - a)*Sqrt[-c] + b*Sqrt[d])])/(
-c)^(3/2) - ((I/4)*Sqrt[d]*PolyLog[2, (Sqrt[-c]*(I + a + b*x))/((I + a)*Sqr
t[-c] - b*Sqrt[d])])/(-c)^(3/2) + ((I/4)*Sqrt[d]*PolyLog[2, (Sqrt[-c]*(I +
a + b*x))/((I + a)*Sqrt[-c] + b*Sqrt[d])])/(-c)^(3/2)
```

Rule 5052

```
Int[ArcCot[(a_) + (b_.)*(x_)]/((c_) + (d_.)*(x_)^(n_.)), x_Symbol] :> Dist[
I/2, Int[Log[(-I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] - Dist[I/2, Int[
Log[(I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d}, x]
&& RationalQ[n]
```

Rule 2513

```
Int[Log[(e_.)*((f_.)*((a_.) + (b_.)*(x_))^(p_.)*((c_.) + (d_.)*(x_))^(q_.))
^(r_.)]*(RFx_.), x_Symbol] :> Dist[p*r, Int[RFx*Log[a + b*x], x], x] + (Dis
t[q*r, Int[RFx*Log[c + d*x], x], x] - Dist[p*r*Log[a + b*x] + q*r*Log[c + d
*x] - Log[e*(f*(a + b*x)^p*(c + d*x)^q)^r], Int[RFx, x], x]) /; FreeQ[{a, b
, c, d, e, f, p, q, r}, x] && RationalFunctionQ[RFx, x] && NeQ[b*c - a*d, 0
] &&  !MatchQ[RFx, (u_.)*(a + b*x)^(m_.)*(c + d*x)^(n_.) /; IntegersQ[m, n]
]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 2389

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.), x_Symbol] :
> Dist[1/e, Subst[Int[(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a
```

```
, b, c, d, e, n, p}, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{c+\frac{d}{x^2}}\,dx = \frac{1}{2}i\int \frac{\log\left(\frac{-i+a+bx}{a+bx}\right)}{c+\frac{d}{x^2}}\,dx - \frac{1}{2}i\int \frac{\log\left(\frac{i+a+bx}{a+bx}\right)}{c+\frac{d}{x^2}}\,dx$$

$$= \frac{1}{2}i\int \frac{\log(-i+a+bx)}{c+\frac{d}{x^2}}\,dx - \frac{1}{2}i\int \frac{\log(i+a+bx)}{c+\frac{d}{x^2}}\,dx - \frac{1}{2}\Big(i\Big(-\log(a+bx)+\log(-i+a+bx)-\mathrm{l}$$

$$= \frac{1}{2}i\int\left(\frac{\log(-i+a+bx)}{c} - \frac{d\log(-i+a+bx)}{c\left(d+cx^2\right)}\right)dx - \frac{1}{2}i\int\left(\frac{\log(i+a+bx)}{c} - \frac{d\log(i+a+bx)}{c\left(d+cx^2\right)}\right)d$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{ix\left(\log(a+bx)-\log(i+a+bx)+\log\left(\frac{i+}{a}\right.\right.}{2c}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c}x}{\sqrt{d}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+\right.}{2c^{3/2}}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c}x}{\sqrt{d}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+\right.}{2c^{3/2}}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c}x}{\sqrt{d}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+\right.}{2c^{3/2}}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c}x}{\sqrt{d}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+\right.}{2c^{3/2}}$$

$$= \frac{ix\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+bx)-\log(-i+a+bx)\right)}{2c} - \frac{i\sqrt{d}\tan^{-1}\left(\frac{\sqrt{c}x}{\sqrt{d}}\right)\left(\log\left(-\frac{i-a-bx}{a+bx}\right)+\log(a+\right.}{2c^{3/2}}$$

Mathematica [B] time = 33.8933, size = 5117, normalized size = 6.96

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/(c + d/x^2),x]
```

```
[Out] Result too large to show
```

Maple [C] time = 1.987, size = 52954, normalized size = 72.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(c+d/x^2),x)
```

```
[Out] result too large to display
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x^2 \operatorname{arccot}(bx+a)}{cx^2+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x^2),x, algorithm="fricas")
```

```
[Out] integral(x^2*arccot(b*x + a)/(c*x^2 + d), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(c+d/x**2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{c+\frac{d}{x^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x^2),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(c + d/x^2), x)
```

3.111 $\int \frac{\cot^{-1}(a+bx)}{c+d\sqrt{x}}\,dx$

Optimal. Leaf size=693

$$-\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c-\sqrt{-a-i}d}\right)}{d^2}-\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c+\sqrt{-a-i}d}\right)}{d^2}+\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c-\sqrt{-a+i}d}\right)}{d^2}+\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c+\sqrt{-a+i}d}\right)}{d^2}-$$

```
[Out] ((-2*I)*Sqrt[I + a]*ArcTan[(Sqrt[b]*Sqrt[x])/Sqrt[I + a]])/(Sqrt[b]*d) + ((
2*I)*Sqrt[I - a]*ArcTanh[(Sqrt[b]*Sqrt[x])/Sqrt[I - a]])/(Sqrt[b]*d) - (I*c
*Log[(d*(Sqrt[-I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c + Sqrt[-I - a]*d)]*Log
[c + d*Sqrt[x]])/d^2 + (I*c*Log[(d*(Sqrt[I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[b
]*c + Sqrt[I - a]*d)]*Log[c + d*Sqrt[x]])/d^2 - (I*c*Log[-((d*(Sqrt[-I - a]
 + Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c - Sqrt[-I - a]*d))]*Log[c + d*Sqrt[x]])/d^2
 + (I*c*Log[-((d*(Sqrt[I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c - Sqrt[I - a]*
d))]*Log[c + d*Sqrt[x]])/d^2 + (I*Sqrt[x]*Log[-((I - a - b*x)/(a + b*x))])/
d - (I*c*Log[c + d*Sqrt[x]]*Log[-((I - a - b*x)/(a + b*x))])/d^2 - (I*Sqrt[
x]*Log[(I + a + b*x)/(a + b*x)])/d + (I*c*Log[c + d*Sqrt[x]]*Log[(I + a + b
*x)/(a + b*x)])/d^2 - (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b]*c
- Sqrt[-I - a]*d)])/d^2 - (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b
]*c + Sqrt[-I - a]*d)])/d^2 + (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sq
rt[b]*c - Sqrt[I - a]*d)])/d^2 + (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/
(Sqrt[b]*c + Sqrt[I - a]*d)])/d^2
```

Rubi [A] time = 2.06471, antiderivative size = 693, normalized size of antiderivative = 1., number of steps used = 55, number of rules used = 16, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.889, Rules used = {5052, 190, 43, 2528, 2523, 12, 481, 205, 208, 2524, 2418, 260, 2416, 2394, 2393, 2391}

$$-\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c-\sqrt{-a-i}d}\right)}{d^2}-\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c+\sqrt{-a-i}d}\right)}{d^2}+\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c-\sqrt{-a+i}d}\right)}{d^2}+\frac{ic\mathrm{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c+\sqrt{-a+i}d}\right)}{d^2}-$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/(c + d*Sqrt[x]),x]
```

```
[Out] ((-2*I)*Sqrt[I + a]*ArcTan[(Sqrt[b]*Sqrt[x])/Sqrt[I + a]])/(Sqrt[b]*d) + ((
2*I)*Sqrt[I - a]*ArcTanh[(Sqrt[b]*Sqrt[x])/Sqrt[I - a]])/(Sqrt[b]*d) - (I*c
*Log[(d*(Sqrt[-I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c + Sqrt[-I - a]*d)]*Log
[c + d*Sqrt[x]])/d^2 + (I*c*Log[(d*(Sqrt[I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[b
```

```
]*c + Sqrt[I - a]*d)]*Log[c + d*Sqrt[x]])/d^2 - (I*c*Log[-((d*(Sqrt[-I - a]
 + Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c - Sqrt[-I - a]*d))]*Log[c + d*Sqrt[x]])/d^2
 + (I*c*Log[-((d*(Sqrt[I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c - Sqrt[I - a]*
d))]*Log[c + d*Sqrt[x]])/d^2 + (I*Sqrt[x]*Log[-((I - a - b*x)/(a + b*x))])/
d - (I*c*Log[c + d*Sqrt[x]]*Log[-((I - a - b*x)/(a + b*x))])/d^2 - (I*Sqrt[
x]*Log[(I + a + b*x)/(a + b*x)])/d + (I*c*Log[c + d*Sqrt[x]]*Log[(I + a + b
*x)/(a + b*x)])/d^2 - (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b]*c
- Sqrt[-I - a]*d)])/d^2 - (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b
]*c + Sqrt[-I - a]*d)])/d^2 + (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sq
rt[b]*c - Sqrt[I - a]*d)])/d^2 + (I*c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/
(Sqrt[b]*c + Sqrt[I - a]*d)])/d^2
```

Rule 5052

```
Int[ArcCot[(a_) + (b_.)*(x_)]/((c_) + (d_.)*(x_)^(n_.)), x_Symbol] :> Dist[
I/2, Int[Log[(-I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] - Dist[I/2, Int[
Log[(I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d}, x]
&& RationalQ[n]
```

Rule 190

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[Int[x^(1/n
- 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b, p}, x] && FractionQ[n] &&
 IntegerQ[1/n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
```

```
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 481

```
Int[((e_.)*(x_))^(m_.)/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))),
 x_Symbol] :> -Dist[(a*e^n)/(b*c - a*d), Int[(e*x)^(m - n)/(a + b*x^n), x],
 x] + Dist[(c*e^n)/(b*c - a*d), Int[(e*x)^(m - n)/(c + d*x^n), x], x] /; Fr
eeQ[{a, b, c, d, e, m}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0] && LeQ[n, m,
2*n - 1]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2416

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((h_.)*(x_))
^(m_.)*((f_) + (g_.)*(x_)^(r_.))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a
 + b*Log[c*(d + e*x)^n])^p, (h*x)^m*(f + g*x^r)^q, x], x] /; FreeQ[{a, b, c
, d, e, f, g, h, m, n, p, q, r}, x] && IntegerQ[m] && IntegerQ[q]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{c+d\sqrt{x}}\,dx = \frac{1}{2}i\int \frac{\log\left(\frac{-i+a+bx}{a+bx}\right)}{c+d\sqrt{x}}\,dx - \frac{1}{2}i\int \frac{\log\left(\frac{i+a+bx}{a+bx}\right)}{c+d\sqrt{x}}\,dx$$

$$= i\,\text{Subst}\left(\int \frac{x\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{c+dx}\,dx, x, \sqrt{x}\right) - i\,\text{Subst}\left(\int \frac{x\log\left(\frac{i+a+bx^2}{a+bx^2}\right)}{c+dx}\,dx, x, \sqrt{x}\right)$$

$$= i\,\text{Subst}\left(\int \left(\frac{\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{d} - \frac{c\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{d(c+dx)}\right)dx, x, \sqrt{x}\right) - i\,\text{Subst}\left(\int \left(\frac{\log\left(\frac{i+a+bx^2}{a+bx^2}\right)}{d} - \frac{c\log\left(\frac{i+}{a}\right.}{d(c+}\right.\right.$$

$$= \frac{i\,\text{Subst}\left(\int \log\left(\frac{-i+a+bx^2}{a+bx^2}\right)dx, x, \sqrt{x}\right)}{d} - \frac{i\,\text{Subst}\left(\int \log\left(\frac{i+a+bx^2}{a+bx^2}\right)dx, x, \sqrt{x}\right)}{d} - \frac{(ic)\,\text{Subst}\left(\int \frac{\log\left(\frac{-i+a}{a+}\right.}{c+d}\right.}{d}$$

$$= \frac{i\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{d} - \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(-\frac{i-a-bx}{a+bx}\right)}{d^2} - \frac{i\sqrt{x}\log\left(\frac{i+a+bx}{a+bx}\right)}{d} + \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(\frac{i+a}{a+}\right.}{d^2}$$

$$= \frac{i\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{d} - \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(-\frac{i-a-bx}{a+bx}\right)}{d^2} - \frac{i\sqrt{x}\log\left(\frac{i+a+bx}{a+bx}\right)}{d} + \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(\frac{i+a}{a+}\right.}{d^2}$$

$$= \frac{i\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{d} - \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(-\frac{i-a-bx}{a+bx}\right)}{d^2} - \frac{i\sqrt{x}\log\left(\frac{i+a+bx}{a+bx}\right)}{d} + \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(\frac{i+a}{a+}\right.}{d^2}$$

$$= -\frac{2i\sqrt{i+a}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}d} + \frac{2i\sqrt{i-a}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}d} + \frac{i\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{d} - \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(-\right.}{d^2}$$

$$= -\frac{2i\sqrt{i+a}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}d} + \frac{2i\sqrt{i-a}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}d} + \frac{i\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{d} - \frac{ic\log\left(c+d\sqrt{x}\right)\log\left(-\right.}{d^2}$$

$$= -\frac{2i\sqrt{i+a}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}d} + \frac{2i\sqrt{i-a}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}d} - \frac{ic\log\left(\frac{d\left(\sqrt{-i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{b}c+\sqrt{-i-a}d}\right)\log\left(c+d\sqrt{x}\right)}{d^2} + \frac{ic\log}{}$$

$$= -\frac{2i\sqrt{i+a}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}d} + \frac{2i\sqrt{i-a}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}d} - \frac{ic\log\left(\frac{d\left(\sqrt{-i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{b}c+\sqrt{-i-a}d}\right)\log\left(c+d\sqrt{x}\right)}{d^2} + \frac{ic\log}{}$$

$$= -\frac{2i\sqrt{i+a}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}d} + \frac{2i\sqrt{i-a}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}d} - \frac{ic\log\left(\frac{d\left(\sqrt{-i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{b}c+\sqrt{-i-a}d}\right)\log\left(c+d\sqrt{x}\right)}{d^2} + \frac{ic\log}{}$$

Mathematica [A] time = 0.73575, size = 618, normalized size = 0.89

$$-\frac{i\left(c\text{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c-\sqrt{-a-i}d}\right)+c\text{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c+\sqrt{-a-i}d}\right)-c\text{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c-\sqrt{-a+i}d}\right)-c\text{PolyLog}\left(2,\frac{\sqrt{b}(c+d\sqrt{x})}{\sqrt{b}c+\sqrt{-a+i}d}\right)+c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/(c + d*Sqrt[x]),x]
```

```
[Out] ((-I)*((2*Sqrt[I + a]*d*ArcTan[(Sqrt[b]*Sqrt[x])/Sqrt[I + a]])/Sqrt[b] - (2
*Sqrt[I - a]*d*ArcTanh[(Sqrt[b]*Sqrt[x])/Sqrt[I - a]])/Sqrt[b] + c*Log[(d*(
Sqrt[-I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c + Sqrt[-I - a]*d)]*Log[c + d*Sq
rt[x]] - c*Log[(d*(Sqrt[I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[b]*c + Sqrt[I - a]
*d)]*Log[c + d*Sqrt[x]] + c*Log[(d*(Sqrt[-I - a] + Sqrt[b]*Sqrt[x]))/(-(Sqr
t[b]*c) + Sqrt[-I - a]*d)]*Log[c + d*Sqrt[x]] - c*Log[(d*(Sqrt[I - a] + Sqr
t[b]*Sqrt[x]))/(-(Sqrt[b]*c) + Sqrt[I - a]*d)]*Log[c + d*Sqrt[x]] - d*Sqrt[
x]*Log[(-I + a + b*x)/(a + b*x)] + c*Log[c + d*Sqrt[x]]*Log[(-I + a + b*x)/
(a + b*x)] + d*Sqrt[x]*Log[(I + a + b*x)/(a + b*x)] - c*Log[c + d*Sqrt[x]]*
Log[(I + a + b*x)/(a + b*x)] + c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt
[b]*c - Sqrt[-I - a]*d)] + c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b]*
c + Sqrt[-I - a]*d)] - c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b]*c -
Sqrt[I - a]*d)] - c*PolyLog[2, (Sqrt[b]*(c + d*Sqrt[x]))/(Sqrt[b]*c + Sqrt[
I - a]*d)]))/d^2
```

Maple [C] time = 0.231, size = 343, normalized size = 0.5

$$2\,\frac{\text{arccot}\,(bx+a)\,\sqrt{x}}{d}-2\,\frac{\text{arccot}\,(bx+a)\,c\ln\left(c+d\sqrt{x}\right)}{d^2}-c\sum_{\_R1=\text{RootOf}\left(b^2\_Z^4-4\,cb^2\_Z^3+\left(2\,abd^2+6\,b^2c^2\right)\_Z^2+\left(-4\,abcd^2-4\,b^2c^3\right)\_Z+a\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(c+d*x^(1/2)),x)
```

```
[Out] 2*arccot(b*x+a)*x^(1/2)/d-2*arccot(b*x+a)*c/d^2*ln(c+d*x^(1/2))-c*sum(1/(_R
1^2*b-2*_R1*b*c+a*d^2+b*c^2)*(ln(c+d*x^(1/2))*ln((-d*x^(1/2)+_R1-c)/_R1)+di
log((-d*x^(1/2)+_R1-c)/_R1)),_R1=RootOf(b^2*_Z^4-4*c*b^2*_Z^3+(2*a*b*d^2+6*
b^2*c^2)*_Z^2+(-4*a*b*c*d^2-4*b^2*c^3)*_Z+a^2*d^4+2*a*b*c^2*d^2+b^2*c^4+d^4
))+sum((_R^2-2*_R*c+c^2)/(_R^3*b-3*_R^2*b*c+_R*a*d^2+3*_R*b*c^2-a*c*d^2-b*c
^3)*ln(d*x^(1/2)-_R+c),_R=RootOf(b^2*_Z^4-4*c*b^2*_Z^3+(2*a*b*d^2+6*b^2*c^2
```

```
)*_Z^2+(-4*a*b*c*d^2-4*b^2*c^3)*_Z+a^2*d^4+2*a*b*c^2*d^2+b^2*c^4+d^4))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{d\sqrt{x}+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d*x^(1/2)),x, algorithm="maxima")
```

```
[Out] integrate(arccot(b*x + a)/(d*sqrt(x) + c), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{d\sqrt{x}\operatorname{arccot}(bx+a)-c\operatorname{arccot}(bx+a)}{d^2x-c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d*x^(1/2)),x, algorithm="fricas")
```

```
[Out] integral((d*sqrt(x)*arccot(b*x + a) - c*arccot(b*x + a))/(d^2*x - c^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(c+d*x**(1/2)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx + a)}{d\sqrt{x} + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d*x^(1/2)),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(d*sqrt(x) + c), x)
```

3.112 $\int \frac{\cot^{-1}(a+bx)}{c+\frac{d}{\sqrt{x}}}\,dx$

Optimal. Leaf size=830

$$\frac{i\log\left(\frac{c\left(\sqrt{-a-i}-\sqrt{b}\sqrt{x}\right)}{\sqrt{-a-i}c+\sqrt{b}d}\right)\log\left(\sqrt{x}c+d\right)d^2}{c^3}-\frac{i\log\left(\frac{c\left(\sqrt{i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{i-a}c+\sqrt{b}d}\right)\log\left(\sqrt{x}c+d\right)d^2}{c^3}+\frac{i\log\left(\frac{c\left(\sqrt{-a-i}+\sqrt{b}\sqrt{x}\right)}{\sqrt{-a-i}c-\sqrt{b}d}\right)\log\left(\sqrt{x}c+d\right)d^2}{c^3}-$$

```
[Out] ((2*I)*Sqrt[I + a]*d*ArcTan[(Sqrt[b]*Sqrt[x])/Sqrt[I + a]])/(Sqrt[b]*c^2) -
 ((2*I)*Sqrt[I - a]*d*ArcTanh[(Sqrt[b]*Sqrt[x])/Sqrt[I - a]])/(Sqrt[b]*c^2)
 + (I*d^2*Log[(c*(Sqrt[-I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[-I - a]*c + Sqrt[b
]*d)]*Log[d + c*Sqrt[x]])/c^3 - (I*d^2*Log[(c*(Sqrt[I - a] - Sqrt[b]*Sqrt[x
]))/(Sqrt[I - a]*c + Sqrt[b]*d)]*Log[d + c*Sqrt[x]])/c^3 + (I*d^2*Log[(c*(S
qrt[-I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[-I - a]*c - Sqrt[b]*d)]*Log[d + c*Sqr
t[x]])/c^3 - (I*d^2*Log[(c*(Sqrt[I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[I - a]*c
- Sqrt[b]*d)]*Log[d + c*Sqrt[x]])/c^3 + ((1 + I*a)*Log[I - a - b*x])/(2*b*c
) - (I*d*Sqrt[x]*Log[-((I - a - b*x)/(a + b*x))])/c^2 + ((I/2)*x*Log[-((I -
 a - b*x)/(a + b*x))])/c + (I*d^2*Log[d + c*Sqrt[x]]*Log[-((I - a - b*x)/(a
 + b*x))])/c^3 + ((1 - I*a)*Log[I + a + b*x])/(2*b*c) + (I*d*Sqrt[x]*Log[(I
 + a + b*x)/(a + b*x)])/c^2 - ((I/2)*x*Log[(I + a + b*x)/(a + b*x)])/c - (I
*d^2*Log[d + c*Sqrt[x]]*Log[(I + a + b*x)/(a + b*x)])/c^3 + (I*d^2*PolyLog[
2, -((Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[-I - a]*c - Sqrt[b]*d))])/c^3 - (I*d^2
*PolyLog[2, -((Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[I - a]*c - Sqrt[b]*d))])/c^3
+ (I*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[-I - a]*c + Sqrt[b]*d)]
)/c^3 - (I*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[I - a]*c + Sqrt[b
]*d)])/c^3
```

Rubi [A] time = 2.32187, antiderivative size = 830, normalized size of antiderivative = 1., number of steps used = 65, number of rules used = 19, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.056, Rules used = {5052, 190, 44, 2528, 2523, 12, 481, 205, 208, 2525, 446, 72, 2524, 2418, 260, 2416, 2394, 2393, 2391}

$$\frac{i\log\left(\frac{c\left(\sqrt{-a-i}-\sqrt{b}\sqrt{x}\right)}{\sqrt{-a-i}c+\sqrt{b}d}\right)\log\left(\sqrt{x}c+d\right)d^2}{c^3}-\frac{i\log\left(\frac{c\left(\sqrt{i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{i-a}c+\sqrt{b}d}\right)\log\left(\sqrt{x}c+d\right)d^2}{c^3}+\frac{i\log\left(\frac{c\left(\sqrt{-a-i}+\sqrt{b}\sqrt{x}\right)}{\sqrt{-a-i}c-\sqrt{b}d}\right)\log\left(\sqrt{x}c+d\right)d^2}{c^3}-$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/(c + d/Sqrt[x]),x]
```

```
[Out] ((2*I)*Sqrt[I + a]*d*ArcTan[(Sqrt[b]*Sqrt[x])/Sqrt[I + a]])/(Sqrt[b]*c^2) -
 ((2*I)*Sqrt[I - a]*d*ArcTanh[(Sqrt[b]*Sqrt[x])/Sqrt[I - a]])/(Sqrt[b]*c^2)
 + (I*d^2*Log[(c*(Sqrt[-I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[-I - a]*c + Sqrt[b
]*d)]*Log[d + c*Sqrt[x]])/c^3 - (I*d^2*Log[(c*(Sqrt[I - a] - Sqrt[b]*Sqrt[x
]))/(Sqrt[I - a]*c + Sqrt[b]*d)]*Log[d + c*Sqrt[x]])/c^3 + (I*d^2*Log[(c*(S
qrt[-I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[-I - a]*c - Sqrt[b]*d)]*Log[d + c*Sqr
t[x]])/c^3 - (I*d^2*Log[(c*(Sqrt[I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[I - a]*c
- Sqrt[b]*d)]*Log[d + c*Sqrt[x]])/c^3 + ((1 + I*a)*Log[I - a - b*x])/(2*b*c
) - (I*d*Sqrt[x]*Log[-((I - a - b*x)/(a + b*x))])/c^2 + ((I/2)*x*Log[-((I -
 a - b*x)/(a + b*x))])/c + (I*d^2*Log[d + c*Sqrt[x]]*Log[-((I - a - b*x)/(a
 + b*x))])/c^3 + ((1 - I*a)*Log[I + a + b*x])/(2*b*c) + (I*d*Sqrt[x]*Log[(I
 + a + b*x)/(a + b*x)])/c^2 - ((I/2)*x*Log[(I + a + b*x)/(a + b*x)])/c - (I
*d^2*Log[d + c*Sqrt[x]]*Log[(I + a + b*x)/(a + b*x)])/c^3 + (I*d^2*PolyLog[
2, -((Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[-I - a]*c - Sqrt[b]*d))])/c^3 - (I*d^2
*PolyLog[2, -((Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[I - a]*c - Sqrt[b]*d))])/c^3
+ (I*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[-I - a]*c + Sqrt[b]*d)]
)/c^3 - (I*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[I - a]*c + Sqrt[b
]*d)])/c^3
```

Rule 5052

```
Int[ArcCot[(a_) + (b_.)*(x_)]/((c_) + (d_.)*(x_)^(n_.)), x_Symbol] :> Dist[
I/2, Int[Log[(-I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] - Dist[I/2, Int[
Log[(I + a + b*x)/(a + b*x)]/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d}, x]
&& RationalQ[n]
```

Rule 190

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[Int[x^(1/n
- 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b, p}, x] && FractionQ[n] &&
 IntegerQ[1/n]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
```

```
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 2523

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.), x_Symbol] :> Simp[x*(a +
 b*Log[c*RFx^p])^n, x] - Dist[b*n*p, Int[SimplifyIntegrand[(x*(a + b*Log[c*
RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, p}, x] && Rat
ionalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 481

```
Int[((e_.)*(x_))^(m_.)/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))),
 x_Symbol] :> -Dist[(a*e^n)/(b*c - a*d), Int[(e*x)^(m - n)/(a + b*x^n), x],
 x] + Dist[(c*e^n)/(b*c - a*d), Int[(e*x)^(m - n)/(c + d*x^n), x], x] /; Fr
eeQ[{a, b, c, d, e, m}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0] && LeQ[n, m,
2*n - 1]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2525

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*((d_.) + (e_.)*(x_))^(m_.
), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(a + b*Log[c*RFx^p])^n)/(e*(m + 1))
, x] - Dist[(b*n*p)/(e*(m + 1)), Int[SimplifyIntegrand[((d + e*x)^(m + 1)*(
a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x], x] /; FreeQ[{a, b, c, d
, e, m, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0] && (EqQ[n, 1] ||
IntegerQ[m]) && NeQ[m, -1]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
```

```
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 2524

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[(Log[d + e*x]*(a + b*Log[c*RFx^p])^n)/e, x] - Dist[(b*n*p)/e
, Int[(Log[d + e*x]*(a + b*Log[c*RFx^p])^(n - 1)*D[RFx, x])/RFx, x], x] /;
FreeQ[{a, b, c, d, e, p}, x] && RationalFunctionQ[RFx, x] && IGtQ[n, 0]
```

Rule 2418

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*(RFx_), x_Sy
mbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*(d + e*x)^n])^p, RFx, x]},
Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n}, x] && RationalFunctionQ[
RFx, x] && IntegerQ[p]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2416

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((h_.)*(x_))
^(m_.)*((f_) + (g_.)*(x_)^(r_.))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a
 + b*Log[c*(d + e*x)^n])^p, (h*x)^m*(f + g*x^r)^q, x], x] /; FreeQ[{a, b, c
, d, e, f, g, h, m, n, p, q, r}, x] && IntegerQ[m] && IntegerQ[q]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{c+\frac{d}{\sqrt{x}}}\,dx = \frac{1}{2}i\int \frac{\log\left(\frac{-i+a+bx}{a+bx}\right)}{c+\frac{d}{\sqrt{x}}}\,dx - \frac{1}{2}i\int \frac{\log\left(\frac{i+a+bx}{a+bx}\right)}{c+\frac{d}{\sqrt{x}}}\,dx$$

$$= i\,\mathrm{Subst}\left(\int \frac{x^2\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{d+cx}\,dx, x, \sqrt{x}\right) - i\,\mathrm{Subst}\left(\int \frac{x^2\log\left(\frac{i+a+bx^2}{a+bx^2}\right)}{d+cx}\,dx, x, \sqrt{x}\right)$$

$$= i\,\mathrm{Subst}\left(\int\left(-\frac{d\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{c^2} + \frac{x\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{c} + \frac{d^2\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)}{c^2(d+cx)}\right)dx, x, \sqrt{x}\right) - i\,\mathrm{Subst}\Bigg(\int\Bigg($$

$$= \frac{i\,\mathrm{Subst}\left(\int x\log\left(\frac{-i+a+bx^2}{a+bx^2}\right)dx, x, \sqrt{x}\right)}{c} - \frac{i\,\mathrm{Subst}\left(\int x\log\left(\frac{i+a+bx^2}{a+bx^2}\right)dx, x, \sqrt{x}\right)}{c} - \frac{(id)\,\mathrm{Subst}\Big(\int \mathrm{lo}}{}$$

$$= -\frac{id\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^2} + \frac{ix\log\left(-\frac{i-a-bx}{a+bx}\right)}{2c} + \frac{id^2\log\left(d+c\sqrt{x}\right)\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^3} + \frac{id\sqrt{x}\log\left(\frac{i+a+bx}{a+bx}\right)}{c^2} -$$

$$= -\frac{id\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^2} + \frac{ix\log\left(-\frac{i-a-bx}{a+bx}\right)}{2c} + \frac{id^2\log\left(d+c\sqrt{x}\right)\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^3} + \frac{id\sqrt{x}\log\left(\frac{i+a+bx}{a+bx}\right)}{c^2} -$$

$$= -\frac{id\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^2} + \frac{ix\log\left(-\frac{i-a-bx}{a+bx}\right)}{2c} + \frac{id^2\log\left(d+c\sqrt{x}\right)\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^3} + \frac{id\sqrt{x}\log\left(\frac{i+a+bx}{a+bx}\right)}{c^2} -$$

$$= \frac{2i\sqrt{i+a}d\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}c^2} - \frac{2i\sqrt{i-a}d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}c^2} - \frac{id\sqrt{x}\log\left(-\frac{i-a-bx}{a+bx}\right)}{c^2} + \frac{ix\log\left(-\frac{i-a-bx}{a+bx}\right)}{2c} +$$

$$= \frac{2i\sqrt{i+a}d\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}c^2} - \frac{2i\sqrt{i-a}d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}c^2} + \frac{(1+ia)\log(i-a-bx)}{2bc} - \frac{id\sqrt{x}\log\Big(-\frac{i-a-}{a+b}}{c^2}$$

$$= \frac{2i\sqrt{i+a}d\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}c^2} - \frac{2i\sqrt{i-a}d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}c^2} + \frac{id^2\log\left(\frac{c\left(\sqrt{-i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{-i-a}c+\sqrt{b}d}\right)\log\left(d+c\sqrt{x}\right)}{c^3} - i$$

$$= \frac{2i\sqrt{i+a}d\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}c^2} - \frac{2i\sqrt{i-a}d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}c^2} + \frac{id^2\log\left(\frac{c\left(\sqrt{-i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{-i-a}c+\sqrt{b}d}\right)\log\left(d+c\sqrt{x}\right)}{c^3} - i$$

$$= \frac{2i\sqrt{i+a}d\tan^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i+a}}\right)}{\sqrt{b}c^2} - \frac{2i\sqrt{i-a}d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{i-a}}\right)}{\sqrt{b}c^2} + \frac{id^2\log\left(\frac{c\left(\sqrt{-i-a}-\sqrt{b}\sqrt{x}\right)}{\sqrt{-i-a}c+\sqrt{b}d}\right)\log\left(d+c\sqrt{x}\right)}{c^3} - i$$

Mathematica [A] time = 0.685635, size = 809, normalized size = 0.97

$$\frac{ia\log(-a-bx+i)c^2+\log(-a-bx+i)c^2+ibx\log\left(\frac{a+bx-i}{a+bx}\right)c^2-ia\log(a+bx+i)c^2+\log(a+bx+i)c^2-ibx\log\left(\frac{a+bx+i}{a+bx}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/(c + d/Sqrt[x]),x]
```

```
[Out] ((4*I)*Sqrt[I + a]*Sqrt[b]*c*d*ArcTan[(Sqrt[b]*Sqrt[x])/Sqrt[I + a]] - (4*I
)*Sqrt[I - a]*Sqrt[b]*c*d*ArcTanh[(Sqrt[b]*Sqrt[x])/Sqrt[I - a]] + (2*I)*b*
d^2*Log[(c*(Sqrt[-I - a] - Sqrt[b]*Sqrt[x]))/(Sqrt[-I - a]*c + Sqrt[b]*d)]*
Log[d + c*Sqrt[x]] - (2*I)*b*d^2*Log[(c*(Sqrt[I - a] - Sqrt[b]*Sqrt[x]))/(S
qrt[I - a]*c + Sqrt[b]*d)]*Log[d + c*Sqrt[x]] + (2*I)*b*d^2*Log[(c*(Sqrt[-I
 - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[-I - a]*c - Sqrt[b]*d)]*Log[d + c*Sqrt[x]]
- (2*I)*b*d^2*Log[(c*(Sqrt[I - a] + Sqrt[b]*Sqrt[x]))/(Sqrt[I - a]*c - Sqrt
[b]*d)]*Log[d + c*Sqrt[x]] + c^2*Log[I - a - b*x] + I*a*c^2*Log[I - a - b*x
] - (2*I)*b*c*d*Sqrt[x]*Log[(-I + a + b*x)/(a + b*x)] + I*b*c^2*x*Log[(-I +
 a + b*x)/(a + b*x)] + (2*I)*b*d^2*Log[d + c*Sqrt[x]]*Log[(-I + a + b*x)/(a
 + b*x)] + c^2*Log[I + a + b*x] - I*a*c^2*Log[I + a + b*x] + (2*I)*b*c*d*Sq
rt[x]*Log[(I + a + b*x)/(a + b*x)] - I*b*c^2*x*Log[(I + a + b*x)/(a + b*x)]
 - (2*I)*b*d^2*Log[d + c*Sqrt[x]]*Log[(I + a + b*x)/(a + b*x)] + (2*I)*b*d^
2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(-(Sqrt[-I - a]*c) + Sqrt[b]*d)] + (
2*I)*b*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[-I - a]*c + Sqrt[b]*d
)] - (2*I)*b*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(-(Sqrt[I - a]*c) + S
qrt[b]*d)] - (2*I)*b*d^2*PolyLog[2, (Sqrt[b]*(d + c*Sqrt[x]))/(Sqrt[I - a]*
c + Sqrt[b]*d)])/(2*b*c^3)
```

Maple [C] time = 0.214, size = 376, normalized size = 0.5

$$\frac{x\mathrm{arccot}\,(bx+a)}{c}-2\,\frac{\mathrm{arccot}\,(bx+a)\,d\sqrt{x}}{c^2}+2\,\frac{\mathrm{arccot}\,(bx+a)\,d^2\ln\left(d+c\sqrt{x}\right)}{c^3}+\frac{d^2}{c}\sum_{\_R1=\mathrm{RootOf}\left(b^2\_Z^4-4\,b^2d\_Z^3+\left(2\,c^2ba+6\,b^2d^2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(c+d/x^(1/2)),x)
```

```
[Out] arccot(b*x+a)/c*x-2*arccot(b*x+a)/c^2*d*x^(1/2)+2*arccot(b*x+a)/c^3*d^2*ln(
d+c*x^(1/2))+1/c*d^2*sum(1/(_R1^2*b-2*_R1*b*d+a*c^2+b*d^2)*(ln(d+c*x^(1/2))
*ln((-c*x^(1/2)+_R1-d)/_R1)+dilog((-c*x^(1/2)+_R1-d)/_R1)),_R1=RootOf(b^2*_
```

```
Z^4-4*b^2*d*_Z^3+(2*a*b*c^2+6*b^2*d^2)*_Z^2+(-4*a*b*c^2*d-4*b^2*d^3)*_Z+a^2
*c^4+2*a*b*c^2*d^2+b^2*d^4+c^4))+1/2/c*sum((_R^3-5*_R^2*d+7*_R*d^2-3*d^3)/(
_R^3*b-3*_R^2*b*d+_R*a*c^2+3*_R*b*d^2-a*c^2*d-b*d^3)*ln(c*x^(1/2)-_R+d),_R=
RootOf(b^2*_Z^4-4*b^2*d*_Z^3+(2*a*b*c^2+6*b^2*d^2)*_Z^2+(-4*a*b*c^2*d-4*b^2
*d^3)*_Z+a^2*c^4+2*a*b*c^2*d^2+b^2*d^4+c^4))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{c+\frac{d}{\sqrt{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x^(1/2)),x, algorithm="maxima")
```

```
[Out] integrate(arccot(b*x + a)/(c + d/sqrt(x)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{cx\operatorname{arccot}(bx+a)-d\sqrt{x}\operatorname{arccot}(bx+a)}{c^2x-d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x^(1/2)),x, algorithm="fricas")
```

```
[Out] integral((c*x*arccot(b*x + a) - d*sqrt(x)*arccot(b*x + a))/(c^2*x - d^2), x
)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(c+d/x**(1/2)),x)
```

```
[Out] Timed out
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{c+\frac{d}{\sqrt{x}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(c+d/x^(1/2)),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(c + d/sqrt(x)), x)
```

3.113 $\int \frac{\cot^{-1}(d+ex)}{a+bx+cx^2}\,dx$

Optimal. Leaf size=367

$$\frac{i\,\mathrm{PolyLog}\left(2,1+\frac{2\left(-e\left(b-\sqrt{b^2-4ac}\right)-2c(d+ex)+2cd\right)}{(1-i(d+ex))\left(-e\sqrt{b^2-4ac}+be-2cd+2ic\right)}\right)}{2\sqrt{b^2-4ac}}-\frac{i\,\mathrm{PolyLog}\left(2,1+\frac{2\left(-e\left(\sqrt{b^2-4ac}+b\right)-2c(d+ex)+2cd\right)}{(1-i(d+ex))\left(e\left(\sqrt{b^2-4ac}+b\right)+2c(-d+i)\right)}\right)}{2\sqrt{b^2-4ac}}+\frac{\cot^{-1}(d+ex)\log}{}$$

```
[Out] (ArcCot[d + e*x]*Log[(2*e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/((2*c*(I - d) +
(b - Sqrt[b^2 - 4*a*c])*e)*(1 - I*(d + e*x)))])/Sqrt[b^2 - 4*a*c] - (ArcCot
[d + e*x]*Log[(2*e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/((2*c*(I - d) + (b + Sq
rt[b^2 - 4*a*c])*e)*(1 - I*(d + e*x)))])/Sqrt[b^2 - 4*a*c] + ((I/2)*PolyLog
[2, 1 + (2*(2*c*d - (b - Sqrt[b^2 - 4*a*c])*e - 2*c*(d + e*x)))/(((2*I)*c -
 2*c*d + b*e - Sqrt[b^2 - 4*a*c]*e)*(1 - I*(d + e*x)))])/Sqrt[b^2 - 4*a*c]
- ((I/2)*PolyLog[2, 1 + (2*(2*c*d - (b + Sqrt[b^2 - 4*a*c])*e - 2*c*(d + e*
x)))/((2*c*(I - d) + (b + Sqrt[b^2 - 4*a*c])*e)*(1 - I*(d + e*x)))])/Sqrt[b
^2 - 4*a*c]
```

Rubi [A] time = 0.686065, antiderivative size = 367, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {618, 206, 6728, 5048, 4857, 2402, 2315, 2447}

$$\frac{i\,\mathrm{PolyLog}\left(2,1+\frac{2\left(-e\left(b-\sqrt{b^2-4ac}\right)-2c(d+ex)+2cd\right)}{(1-i(d+ex))\left(-e\sqrt{b^2-4ac}+be-2cd+2ic\right)}\right)}{2\sqrt{b^2-4ac}}-\frac{i\,\mathrm{PolyLog}\left(2,1+\frac{2\left(-e\left(\sqrt{b^2-4ac}+b\right)-2c(d+ex)+2cd\right)}{(1-i(d+ex))\left(e\left(\sqrt{b^2-4ac}+b\right)+2c(-d+i)\right)}\right)}{2\sqrt{b^2-4ac}}+\frac{\cot^{-1}(d+ex)\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[d + e*x]/(a + b*x + c*x^2),x]
```

```
[Out] (ArcCot[d + e*x]*Log[(2*e*(b - Sqrt[b^2 - 4*a*c] + 2*c*x))/((2*c*(I - d) +
(b - Sqrt[b^2 - 4*a*c])*e)*(1 - I*(d + e*x)))])/Sqrt[b^2 - 4*a*c] - (ArcCot
[d + e*x]*Log[(2*e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/((2*c*(I - d) + (b + Sq
rt[b^2 - 4*a*c])*e)*(1 - I*(d + e*x)))])/Sqrt[b^2 - 4*a*c] + ((I/2)*PolyLog
[2, 1 + (2*(2*c*d - (b - Sqrt[b^2 - 4*a*c])*e - 2*c*(d + e*x)))/(((2*I)*c -
 2*c*d + b*e - Sqrt[b^2 - 4*a*c]*e)*(1 - I*(d + e*x)))])/Sqrt[b^2 - 4*a*c]
- ((I/2)*PolyLog[2, 1 + (2*(2*c*d - (b + Sqrt[b^2 - 4*a*c])*e - 2*c*(d + e*
x)))/((2*c*(I - d) + (b + Sqrt[b^2 - 4*a*c])*e)*(1 - I*(d + e*x)))])/Sqrt[b
^2 - 4*a*c]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 6728

```
Int[(u_)/((a_.) + (b_.)*(x_)^(n_.) + (c_.)*(x_)^(n2_.)), x_Symbol] :> With[
{v = RationalFunctionExpand[u/(a + b*x^n + c*x^(2*n)), x]}, Int[v, x] /; Su
mQ[v]] /; FreeQ[{a, b, c}, x] && EqQ[n2, 2*n] && IGtQ[n, 0]
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{\cot^{-1}(d+ex)}{a+bx+cx^2}\,dx = \int\left(\frac{2c\cot^{-1}(d+ex)}{\sqrt{b^2-4ac}\left(b-\sqrt{b^2-4ac}+2cx\right)}-\frac{2c\cot^{-1}(d+ex)}{\sqrt{b^2-4ac}\left(b+\sqrt{b^2-4ac}+2cx\right)}\right)dx$$

$$=\frac{(2c)\int\frac{\cot^{-1}(d+ex)}{b-\sqrt{b^2-4ac}+2cx}\,dx}{\sqrt{b^2-4ac}}-\frac{(2c)\int\frac{\cot^{-1}(d+ex)}{b+\sqrt{b^2-4ac}+2cx}\,dx}{\sqrt{b^2-4ac}}$$

$$=\frac{(2c)\,\text{Subst}\left(\int\frac{\cot^{-1}(x)}{\frac{-2cd+\left(b-\sqrt{b^2-4ac}\right)e}{e}+\frac{2cx}{e}}\,dx,x,d+ex\right)}{\sqrt{b^2-4ac}e}-\frac{(2c)\,\text{Subst}\left(\int\frac{\cot^{-1}(x)}{\frac{-2cd+\left(b+\sqrt{b^2-4ac}\right)e}{e}+\frac{2cx}{e}}\,dx,x,d+ex\right)}{\sqrt{b^2-4ac}e}$$

$$=\frac{\cot^{-1}(d+ex)\log\left(\frac{2e\left(b-\sqrt{b^2-4ac}+2cx\right)}{\left(2ic-2cd+be-\sqrt{b^2-4ac}e\right)(1-i(d+ex))}\right)}{\sqrt{b^2-4ac}}-\frac{\cot^{-1}(d+ex)\log\left(\frac{2e\left(b+\sqrt{b^2-4ac}+2cx\right)}{\left(2c(i-d)+\left(b+\sqrt{b^2-4ac}\right)e\right)(1-i(d+ex$$

$$=\frac{\cot^{-1}(d+ex)\log\left(\frac{2e\left(b-\sqrt{b^2-4ac}+2cx\right)}{\left(2ic-2cd+be-\sqrt{b^2-4ac}e\right)(1-i(d+ex))}\right)}{\sqrt{b^2-4ac}}-\frac{\cot^{-1}(d+ex)\log\left(\frac{2e\left(b+\sqrt{b^2-4ac}+2cx\right)}{\left(2c(i-d)+\left(b+\sqrt{b^2-4ac}\right)e\right)(1-i(d+ex$$

Mathematica [A] time = 0.454859, size = 629, normalized size = 1.71

$$-\frac{i\left(\text{PolyLog}\left(2,\frac{e\left(\sqrt{b^2-4ac}-b-2cx\right)}{e\left(\sqrt{b^2-4ac}-b\right)+2c(d-i)}\right)-\text{PolyLog}\left(2,\frac{e\left(\sqrt{b^2-4ac}-b-2cx\right)}{e\left(\sqrt{b^2-4ac}-b\right)+2c(d+i)}\right)-\text{PolyLog}\left(2,\frac{e\left(\sqrt{b^2-4ac}+b+2cx\right)}{e\left(\sqrt{b^2-4ac}+b\right)-2c(d-i)}\right)+\text{PolyLog}\left(\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[d + e*x]/(a + b*x + c*x^2),x]
```

```
[Out] ((-I/2)*(Log[b - Sqrt[b^2 - 4*a*c] + 2*c*x]*Log[(2*c*(-I + d + e*x))/(2*c*(
-I + d) + (-b + Sqrt[b^2 - 4*a*c])*e)] - Log[b + Sqrt[b^2 - 4*a*c] + 2*c*x]
*Log[(2*c*(-I + d + e*x))/(2*c*(-I + d) - (b + Sqrt[b^2 - 4*a*c])*e)] - Log
[b - Sqrt[b^2 - 4*a*c] + 2*c*x]*Log[(-I + d + e*x)/(d + e*x)] + Log[b + Sqr
t[b^2 - 4*a*c] + 2*c*x]*Log[(-I + d + e*x)/(d + e*x)] - Log[b - Sqrt[b^2 -
4*a*c] + 2*c*x]*Log[(2*c*(I + d + e*x))/(2*c*(I + d) + (-b + Sqrt[b^2 - 4*a
*c])*e)] + Log[b + Sqrt[b^2 - 4*a*c] + 2*c*x]*Log[(2*c*(I + d + e*x))/(2*c*
(I + d) - (b + Sqrt[b^2 - 4*a*c])*e)] + Log[b - Sqrt[b^2 - 4*a*c] + 2*c*x]*
Log[(I + d + e*x)/(d + e*x)] - Log[b + Sqrt[b^2 - 4*a*c] + 2*c*x]*Log[(I +
d + e*x)/(d + e*x)] + PolyLog[2, (e*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x))/(2*c*
(-I + d) + (-b + Sqrt[b^2 - 4*a*c])*e)] - PolyLog[2, (e*(-b + Sqrt[b^2 - 4*
a*c] - 2*c*x))/(2*c*(I + d) + (-b + Sqrt[b^2 - 4*a*c])*e)] - PolyLog[2, (e*
(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(-2*c*(-I + d) + (b + Sqrt[b^2 - 4*a*c])*e
)] + PolyLog[2, (e*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))/(-2*c*(I + d) + (b + Sq
rt[b^2 - 4*a*c])*e)]))/Sqrt[b^2 - 4*a*c]
```

Maple [B] time = 1.072, size = 4601, normalized size = 12.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(e*x+d)/(c*x^2+b*x+a),x)
```

```
[Out] -e/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2-1/2*e/(a*e
^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*
e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))
^(1/2)+c))-e/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2-
1/2*e/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*
c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4
*a*c-b^2))^(1/2)+c))+1/4*I*e*(e^2*(4*a*c-b^2))^(1/2)/c/(4*a*c-b^2)/(a*e^2-b
*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2
-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)
)*arccot(e*x+d)*b^2-1/4*I*e*(e^2*(4*a*c-b^2))^(1/2)/c/(4*a*c-b^2)/(a*e^2-b*
e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-
c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c))
*arccot(e*x+d)*b^2+1/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c
*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2*d^2-1/e*(e^2*(4*a*c-b^2))^(
1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x
+d)^2*d^2-1/2/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e
```

^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x
+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c))*d^2+1/
2/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^
2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*
x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))*d^2+1/8*e*(e^2*(4*
a*c-b^2))^(1/2)/c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)
*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a
*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))*b^2+1/4*e*(e^2*(4*a*c-b^2))^(1
/2)/c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+
d)^2*b^2-1/4*e*(e^2*(4*a*c-b^2))^(1/2)/c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^
2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2*b^2-1/8*e*(e^2*(4*a*c-b^2))^(1/2)/c
/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e
-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+
(e^2*(4*a*c-b^2))^(1/2)+c))*b^2+1/4*I*e*(e^2*(4*a*c-b^2))^(1/2)/c/(a*e^2-b*
e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-
c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))
*arccot(e*x+d)-1/4*I*e*(e^2*(4*a*c-b^2))^(1/2)/c/(a*e^2-b*e*d+c*d^2+(e^2*(4
*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((
e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)-I*
(e^2*(4*a*c-b^2))^(1/2)/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1
/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(
a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)*b*d+I/e*(e^2*(4
*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c
)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2
-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)+I*(e^2*(4*a*c-b^2))^
(1/2)/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e
-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+
(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)*b*d-I/e*(e^2*(4*a*c-b^2))^(1/2)*c
/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*
d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*
(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)+1/8*e*(e^2*(4*a*c-b^2))^(1/2)/c/(a*e^2
-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*e*
d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(
1/2)+c))+I/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*
(4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/
((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)*
d^2-I/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*
c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x
+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)*d^2-1
/4*e*(e^2*(4*a*c-b^2))^(1/2)/c/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c
)*arccot(e*x+d)^2-I*e/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*ln(1-(I
*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*
d^2-(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)-I*e/(a*e^2-b*e*d+c*d^2+(e^2*(
4*a*c-b^2))^(1/2)+c)*ln(1-(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/(
(e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c))*arccot(e*x+d)+(

```
e^2*(4*a*c-b^2))^(1/2)/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/
2)+c)*arccot(e*x+d)^2*b*d+1/2*(e^2*(4*a*c-b^2))^(1/2)/(4*a*c-b^2)/(a*e^2-b*
e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*e*d+c
*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2
)+c))*b*d-(e^2*(4*a*c-b^2))^(1/2)/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*
c-b^2))^(1/2)+c)*arccot(e*x+d)^2*b*d-1/2*(e^2*(4*a*c-b^2))^(1/2)/(4*a*c-b^2
)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+a*
e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c
-b^2))^(1/2)+c))*b*d-1/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d
+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2-1/2/e*(e^2*(4*a*c-b^2))^(
1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,
(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+
c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c))+1/e*(e^2*(4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)
/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2+1/2/e*(e^2*(
4*a*c-b^2))^(1/2)*c/(4*a*c-b^2)/(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+
c)*polylog(2,(I*b*e-2*I*d*c+a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/
(a*e^2-b*e*d+c*d^2-(e^2*(4*a*c-b^2))^(1/2)+c))-1/8*e*(e^2*(4*a*c-b^2))^(1/2
)/c/(a*e^2-b*e*d+c*d^2+(e^2*(4*a*c-b^2))^(1/2)+c)*polylog(2,(I*b*e-2*I*d*c+
a*e^2-b*e*d+c*d^2-c)*(e*x+d+I)^2/((e*x+d)^2+1)/(a*e^2-b*e*d+c*d^2+(e^2*(4*a
*c-b^2))^(1/2)+c))+1/4*e*(e^2*(4*a*c-b^2))^(1/2)/c/(a*e^2-b*e*d+c*d^2-(e^2*
(4*a*c-b^2))^(1/2)+c)*arccot(e*x+d)^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(e*x+d)/(c*x^2+b*x+a),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(ex+d)}{cx^2+bx+a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(e*x+d)/(c*x^2+b*x+a),x, algorithm="fricas")
```

```
[Out] integral(arccot(e*x + d)/(c*x^2 + b*x + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(e*x+d)/(c*x**2+b*x+a),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(ex+d)}{cx^2+bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(e*x+d)/(c*x^2+b*x+a),x, algorithm="giac")
```

```
[Out] integrate(arccot(e*x + d)/(c*x^2 + b*x + a), x)
```

3.114 $\int \frac{\cot^{-1}(a+bx)}{\sqrt{1+a^2+2abx+b^2x^2}}\,dx$

Optimal. Leaf size=132

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b}-\frac{2i\tan^{-1}\left(\frac{\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)\cot^{-1}(a+bx)}{b}$$

```
[Out] ((-2*I)*ArcCot[a + b*x]*ArcTan[Sqrt[1 + I*(a + b*x)]/Sqrt[1 - I*(a + b*x)]]
)/b - (I*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/b
+ (I*PolyLog[2, (I*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/b
```

Rubi [A] time = 0.0964322, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {5056, 4887}

$$-\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b}+\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b}-\frac{2i\tan^{-1}\left(\frac{\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)\cot^{-1}(a+bx)}{b}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/Sqrt[1 + a^2 + 2*a*b*x + b^2*x^2],x]
```

```
[Out] ((-2*I)*ArcCot[a + b*x]*ArcTan[Sqrt[1 + I*(a + b*x)]/Sqrt[1 - I*(a + b*x)]]
)/b - (I*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/b
+ (I*PolyLog[2, (I*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/b
```

Rule 5056

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(q_.), x_Symbol] :> Dist[1/d, Subst[Int[(C/d^2 + (C*x^2)/d^2)^
q*(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C, p
, q}, x] && EqQ[B*(1 + c^2) - 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 4887

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcCot[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (-Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*
c*x])])/(c*Sqrt[d]), x] + Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
 I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
```

```
GtQ[d, 0]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{\sqrt{1+a^2+2abx+b^2x^2}}\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{\sqrt{1+x^2}}\,dx, x, a+bx\right)}{b}$$
$$= -\frac{2i\cot^{-1}(a+bx)\tan^{-1}\left(\frac{\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b} - \frac{i\text{Li}_2\left(-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b} + \frac{i\text{Li}_2\left(\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b}$$

Mathematica [A] time = 0.143723, size = 127, normalized size = 0.96

$$-\frac{\sqrt{a^2+2abx+b^2x^2+1}\left(i\text{PolyLog}\left(2,-e^{i\cot^{-1}(a+bx)}\right)-i\text{PolyLog}\left(2,e^{i\cot^{-1}(a+bx)}\right)+\cot^{-1}(a+bx)\left(\log\left(1-e^{i\cot^{-1}(a+bx)}\right.\right.\right.}{b(a+bx)\sqrt{\frac{1}{(a+bx)^2}+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/Sqrt[1 + a^2 + 2*a*b*x + b^2*x^2],x]
```

```
[Out] -((Sqrt[1 + a^2 + 2*a*b*x + b^2*x^2]*(ArcCot[a + b*x]*(Log[1 - E^(I*ArcCot[
a + b*x])] - Log[1 + E^(I*ArcCot[a + b*x])]) + I*PolyLog[2, -E^(I*ArcCot[a
+ b*x])] - I*PolyLog[2, E^(I*ArcCot[a + b*x])]))/(b*(a + b*x)*Sqrt[1 + (a +
 b*x)^(-2)]))
```

Maple [A] time = 0.429, size = 123, normalized size = 0.9

$$-\frac{\text{arccot}\,(bx+a)}{b}\ln\left(1-(i+a+bx)\frac{1}{\sqrt{1+(bx+a)^2}}\right)+\frac{\text{arccot}\,(bx+a)}{b}\ln\left(1+(i+a+bx)\frac{1}{\sqrt{1+(bx+a)^2}}\right)-\frac{i}{b}\text{polylo}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x)
```

```
[Out] -1/b*arccot(b*x+a)*ln(1-(I+a+b*x)/(1+(b*x+a)^2)^(1/2))+1/b*arccot(b*x+a)*ln
(1+(I+a+b*x)/(1+(b*x+a)^2)^(1/2))-I/b*polylog(2,-(I+a+b*x)/(1+(b*x+a)^2)^(1
```

```
/2))+I/b*polylog(2,(I+a+b*x)/(1+(b*x+a)^2)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\operatorname{arccot}\left(bx+a\right)}{\sqrt{b^2x^2+2\,abx+a^2+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x, algorithm="fricas"
)
```

```
[Out] integral(arccot(b*x + a)/sqrt(b^2*x^2 + 2*a*b*x + a^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{acot}\left(a+bx\right)}{\sqrt{a^2+2abx+b^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(b**2*x**2+2*a*b*x+a**2+1)**(1/2),x)
```

```
[Out] Integral(acot(a + b*x)/sqrt(a**2 + 2*a*b*x + b**2*x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx + a)}{\sqrt{b^2x^2 + 2\,abx + a^2 + 1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/sqrt(b^2*x^2 + 2*a*b*x + a^2 + 1), x)
```

3.115 $\int \frac{\cot^{-1}(a+bx)}{\sqrt{(1+a^2)c+2abcx+b^2cx^2}}\,dx$

Optimal. Leaf size=216

$$-\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b\sqrt{c(a+bx)^2+c}}+\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b\sqrt{c(a+bx)^2+c}}-\frac{2i\sqrt{(a+bx)^2+1}\tan^{-1}\left(\frac{\sqrt{1+i(a+}}{\sqrt{1-i(a+}}\right.}{b\sqrt{c(a+bx)^2+}}$$

```
[Out] ((-2*I)*Sqrt[1 + (a + b*x)^2]*ArcCot[a + b*x]*ArcTan[Sqrt[1 + I*(a + b*x)]/
Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2]) - (I*Sqrt[1 + (a + b*x)
^2]*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt
[c + c*(a + b*x)^2]) + (I*Sqrt[1 + (a + b*x)^2]*PolyLog[2, (I*Sqrt[1 + I*(a
 + b*x)])/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2])
```

Rubi [A] time = 0.167586, antiderivative size = 216, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {5056, 4891, 4887}

$$-\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b\sqrt{c(a+bx)^2+c}}+\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b\sqrt{c(a+bx)^2+c}}-\frac{2i\sqrt{(a+bx)^2+1}\tan^{-1}\left(\frac{\sqrt{1+i(a+}}{\sqrt{1-i(a+}}\right.}{b\sqrt{c(a+bx)^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/Sqrt[(1 + a^2)*c + 2*a*b*c*x + b^2*c*x^2],x]
```

```
[Out] ((-2*I)*Sqrt[1 + (a + b*x)^2]*ArcCot[a + b*x]*ArcTan[Sqrt[1 + I*(a + b*x)]/
Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2]) - (I*Sqrt[1 + (a + b*x)
^2]*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt
[c + c*(a + b*x)^2]) + (I*Sqrt[1 + (a + b*x)^2]*PolyLog[2, (I*Sqrt[1 + I*(a
 + b*x)])/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2])
```

Rule 5056

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((A_.) + (B_.)*(x_) + (
C_.)*(x_)^2)^(q_.), x_Symbol] :> Dist[1/d, Subst[Int[(C/d^2 + (C*x^2)/d^2)^
q*(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, A, B, C, p
, q}, x] && EqQ[B*(1 + c^2) - 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 4891

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcCot[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4887

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcCot[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (-Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*
c*x])])/(c*Sqrt[d]), x] + Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
 I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 GtQ[d, 0]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{\sqrt{(1+a^2)\,c+2abcx+b^2cx^2}}\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{\sqrt{c+cx^2}}\,dx, x, a+bx\right)}{b}$$

$$= \frac{\sqrt{1+(a+bx)^2}\,\text{Subst}\left(\int \frac{\cot^{-1}(x)}{\sqrt{1+x^2}}\,dx, x, a+bx\right)}{b\sqrt{c+c(a+bx)^2}}$$

$$= -\frac{2i\sqrt{1+(a+bx)^2}\cot^{-1}(a+bx)\tan^{-1}\left(\frac{\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{b\sqrt{c+c(a+bx)^2}} - \frac{i\sqrt{1+(a+bx)^2}\,\text{Li}_2\left(-\frac{i\sqrt{1+i(}}{\sqrt{1-i(}}\right.}{b\sqrt{c+c(a+bx)^2}}$$

Mathematica [A] time = 0.0765339, size = 138, normalized size = 0.64

$$-\frac{\left((a+bx)^2+1\right)\left(i\text{PolyLog}\left(2,-e^{i\cot^{-1}(a+bx)}\right)-i\text{PolyLog}\left(2,e^{i\cot^{-1}(a+bx)}\right)+\cot^{-1}(a+bx)\left(\log\left(1-e^{i\cot^{-1}(a+bx)}\right)-\log\right.\right.}{b(a+bx)\sqrt{\frac{1}{(a+bx)^2}+1}\sqrt{c\left(a^2+2abx+b^2x^2+1\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/Sqrt[(1 + a^2)*c + 2*a*b*c*x + b^2*c*x^2],x]
```

```
[Out] -(((1 + (a + b*x)^2)*(ArcCot[a + b*x]*(Log[1 - E^(I*ArcCot[a + b*x])] - Log
[1 + E^(I*ArcCot[a + b*x])]) + I*PolyLog[2, -E^(I*ArcCot[a + b*x])] - I*Pol
yLog[2, E^(I*ArcCot[a + b*x])]))/(b*(a + b*x)*Sqrt[c*(1 + a^2 + 2*a*b*x + b
^2*x^2)]*Sqrt[1 + (a + b*x)^(-2)]))
```

Maple [A] time = 0.518, size = 156, normalized size = 0.7

$$\frac{i}{cb}\left(i\mathrm{arccot}\left(bx+a\right)\ln\left(1-\left(i+a+bx\right)\frac{1}{\sqrt{1+\left(bx+a\right)^{2}}}\right)-i\mathrm{arccot}\left(bx+a\right)\ln\left(1+\left(i+a+bx\right)\frac{1}{\sqrt{1+\left(bx+a\right)^{2}}}\right)-\mathrm{polylo}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+b^2*c*x^2)^(1/2),x)
```

```
[Out] I*(I*arccot(b*x+a)*ln(1-(I+a+b*x)/(1+(b*x+a)^2)^(1/2))-I*arccot(b*x+a)*ln(1
+(I+a+b*x)/(1+(b*x+a)^2)^(1/2))-polylog(2,-(I+a+b*x)/(1+(b*x+a)^2)^(1/2))+p
olylog(2,(I+a+b*x)/(1+(b*x+a)^2)^(1/2)))*(c*(-I+a+b*x)*(I+a+b*x))^(1/2)/(b^
2*x^2+2*a*b*x+a^2+1)^(1/2)/c/b
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/2),x, algorithm=
"maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\mathrm{arccot}\left(bx+a\right)}{\sqrt{b^{2}cx^{2}+2\,abcx+\left(a^{2}+1\right)c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/2),x, algorithm=
"fricas")
```

```
[Out] integral(arccot(b*x + a)/sqrt(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(a+bx)}{\sqrt{c\left(a^2+2abx+b^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/((a**2+1)*c+2*a*b*c*x+c*x**2*b**2)**(1/2),x)
```

```
[Out] Integral(acot(a + b*x)/sqrt(c*(a**2 + 2*a*b*x + b**2*x**2 + 1)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{\sqrt{b^2cx^2+2\,abcx+\left(a^2+1\right)c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/2),x, algorithm=
"giac")
```

```
[Out] integrate(arccot(b*x + a)/sqrt(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c), x)
```

3.116 $\int \frac{\cot^{-1}(a+bx)}{\sqrt[3]{1+a^2+2abx+b^2x^2}}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{\cot^{-1}(a+bx)}{\sqrt[3]{(a+bx)^2+1}},x\right)$$

```
[Out] Unintegrable[ArcCot[a + b*x]/(1 + (a + b*x)^2)^(1/3), x]
```

Rubi [A] time = 0.0400934, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(a+bx)}{\sqrt[3]{1+a^2+2abx+b^2x^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[a + b*x]/(1 + a^2 + 2*a*b*x + b^2*x^2)^(1/3),x]
```

```
[Out] Defer[Subst][Defer[Int][ArcCot[x]/(1 + x^2)^(1/3), x], x, a + b*x]/b
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{\sqrt[3]{1+a^2+2abx+b^2x^2}}\,dx=\frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{\sqrt[3]{1+x^2}}\,dx,x,a+bx\right)}{b}$$

Mathematica [A] time = 0.37931, size = 177, normalized size = 8.05

$$\frac{6\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(4(a+bx)\,_2F_1\left(1,\frac{4}{3};\frac{11}{6};\frac{1}{a^2+2bxa+b^2x^2+1}\right)\cot^{-1}(a+bx)+5\left(a^2+2abx+b^2x^2+1\right)\left(2(a+bx)\right.\right.}{20b\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(a^2+\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/(1 + a^2 + 2*a*b*x + b^2*x^2)^(1/3),x]
```

```
[Out] (6*Gamma[11/6]*Gamma[7/3]*(5*(1 + a^2 + 2*a*b*x + b^2*x^2)*(-3 + 2*(a + b*x
)*ArcCot[a + b*x]) + 4*(a + b*x)*ArcCot[a + b*x]*Hypergeometric2F1[1, 4/3,
11/6, (1 + a^2 + 2*a*b*x + b^2*x^2)^(-1)]) - 5*2^(1/3)*Sqrt[Pi]*Gamma[5/3]*
HypergeometricPFQ[{1, 4/3, 4/3}, {11/6, 7/3}, (1 + a^2 + 2*a*b*x + b^2*x^2)
^(-1)])/(20*b*(1 + a^2 + 2*a*b*x + b^2*x^2)^(4/3)*Gamma[11/6]*Gamma[7/3])
```

Maple [A] time = 1.135, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(bx+a)\frac{1}{\sqrt[3]{b^2x^2+2\,xab+a^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x)
```

```
[Out] int(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{\left(b^2x^2+2\,abx+a^2+1\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x, algorithm="maxima"
)
```

```
[Out] integrate(arccot(b*x + a)/(b^2*x^2 + 2*a*b*x + a^2 + 1)^(1/3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(bx+a)}{\left(b^2x^2+2\,abx+a^2+1\right)^{\frac{1}{3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x, algorithm="fricas"
)
```

```
[Out] integral(arccot(b*x + a)/(b^2*x^2 + 2*a*b*x + a^2 + 1)^(1/3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(a+bx)}{\sqrt[3]{a^2+2abx+b^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(b**2*x**2+2*a*b*x+a**2+1)**(1/3),x)
```

```
[Out] Integral(acot(a + b*x)/(a**2 + 2*a*b*x + b**2*x**2 + 1)**(1/3), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{\left(b^2x^2+2\,abx+a^2+1\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(b^2*x^2 + 2*a*b*x + a^2 + 1)^(1/3), x)
```

3.117 $\int \frac{\cot^{-1}(a+bx)}{\sqrt[3]{\left(1+a^2\right)c+2abcx+b^2cx^2}}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\cot^{-1}(a+bx)}{\sqrt[3]{c(a+bx)^2+c}},x\right)$$

```
[Out] Unintegrable[ArcCot[a + b*x]/(c + c*(a + b*x)^2)^(1/3), x]
```

Rubi [A] time = 0.0533345, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(a+bx)}{\sqrt[3]{\left(1+a^2\right)c+2abcx+b^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[a + b*x]/((1 + a^2)*c + 2*a*b*c*x + b^2*c*x^2)^(1/3),x]
```

```
[Out] Defer[Subst][Defer[Int][ArcCot[x]/(c + c*x^2)^(1/3), x], x, a + b*x]/b
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{\sqrt[3]{\left(1+a^2\right)c+2abcx+b^2cx^2}}\,dx=\frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{\sqrt[3]{c+cx^2}}\,dx,x,a+bx\right)}{b}$$

Mathematica [A] time = 0.0850221, size = 180, normalized size = 7.5

$$\frac{c\left(6\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(4(a+bx)\,{}_2F_1\left(1,\frac{4}{3};\frac{11}{6};\frac{1}{a^2+2bxa+b^2x^2+1}\right)\cot^{-1}(a+bx)+5\left(a^2+2abx+b^2x^2+1\right)\left(2(a+\right.\right.\right.}{20b\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(c\left(a\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[a + b*x]/((1 + a^2)*c + 2*a*b*c*x + b^2*c*x^2)^(1/3),x]
```

```
[Out] (c*(6*Gamma[11/6]*Gamma[7/3]*(5*(1 + a^2 + 2*a*b*x + b^2*x^2)*(-3 + 2*(a +
b*x)*ArcCot[a + b*x]) + 4*(a + b*x)*ArcCot[a + b*x]*Hypergeometric2F1[1, 4/
3, 11/6, (1 + a^2 + 2*a*b*x + b^2*x^2)^(-1)]) - 5*2^(1/3)*Sqrt[Pi]*Gamma[5/
3]*HypergeometricPFQ[{1, 4/3, 4/3}, {11/6, 7/3}, (1 + a^2 + 2*a*b*x + b^2*x
^2)^(-1)]))/(20*b*(c*(1 + a^2 + 2*a*b*x + b^2*x^2))^(4/3)*Gamma[11/6]*Gamma
[7/3])
```

Maple [A] time = 1.108, size = 0, normalized size = 0.

$$\int \operatorname{arccot}(bx+a)\,\frac{1}{\sqrt[3]{(a^2+1)\,c+2\,abcx+b^2cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+b^2*c*x^2)^(1/3),x)
```

```
[Out] int(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+b^2*c*x^2)^(1/3),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{\left(b^2cx^2+2\,abcx+(a^2+1)c\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/3),x, algorithm=
"maxima")
```

```
[Out] integrate(arccot(b*x + a)/(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c)^(1/3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(bx+a)}{\left(b^2cx^2+2\,abcx+(a^2+1)c\right)^{\frac{1}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/3),x, algorithm=
"fricas")
```

```
[Out] integral(arccot(b*x + a)/(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c)^(1/3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(a+bx)}{\sqrt[3]{c\left(a^2+2abx+b^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/((a**2+1)*c+2*a*b*c*x+c*x**2*b**2)**(1/3),x)
```

```
[Out] Integral(acot(a + b*x)/(c*(a**2 + 2*a*b*x + b**2*x**2 + 1))**(1/3), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{\left(b^2cx^2+2\,abcx+\left(a^2+1\right)c\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/3),x, algorithm=
"giac")
```

```
[Out] integrate(arccot(b*x + a)/(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c)^(1/3), x)
```

3.118 $\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt{1+a^2+2abx+b^2x^2}}\,dx$

Optimal. Leaf size=187

$$\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b}-\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b}+\frac{\sqrt{(a+bx)^2+1}}{2b}+\frac{(a+bx)\sqrt{(a+bx)^2+1}\cot^{-1}(a+bx)}{2b}+\frac{i\tan}{}$$

```
[Out] Sqrt[1 + (a + b*x)^2]/(2*b) + ((a + b*x)*Sqrt[1 + (a + b*x)^2]*ArcCot[a + b
*x])/(2*b) + (I*ArcCot[a + b*x]*ArcTan[Sqrt[1 + I*(a + b*x)]/Sqrt[1 - I*(a
+ b*x)]])/b + ((I/2)*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a
+ b*x)]])/b - ((I/2)*PolyLog[2, (I*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b
*x)]])/b
```

Rubi [A] time = 0.2229, antiderivative size = 187, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.114, Rules used = {5058, 4953, 261, 4887}

$$\frac{i\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b}-\frac{i\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b}+\frac{\sqrt{(a+bx)^2+1}}{2b}+\frac{(a+bx)\sqrt{(a+bx)^2+1}\cot^{-1}(a+bx)}{2b}+\frac{i\tan}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^2*ArcCot[a + b*x])/Sqrt[1 + a^2 + 2*a*b*x + b^2*x^2],x]
```

```
[Out] Sqrt[1 + (a + b*x)^2]/(2*b) + ((a + b*x)*Sqrt[1 + (a + b*x)^2]*ArcCot[a + b
*x])/(2*b) + (I*ArcCot[a + b*x]*ArcTan[Sqrt[1 + I*(a + b*x)]/Sqrt[1 - I*(a
+ b*x)]])/b + ((I/2)*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a
+ b*x)]])/b - ((I/2)*PolyLog[2, (I*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b
*x)]])/b
```

Rule 5058

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)^(q_.), x_Symbol] :> Dist[1/d, Subst
[Int[((d*e - c*f)/d + (f*x)/d)^m*(C/d^2 + (C*x^2)/d^2)^q*(a + b*ArcCot[x])^
p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m, p, q}, x] &&
 EqQ[B*(1 + c^2) - 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 4953

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcCot[c*x])^p)/(c^2*d*m), x] + (Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
+ b*ArcCot[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^2
*m), Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4887

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcCot[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (-Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*
c*x])])/(c*Sqrt[d]), x] + Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
 I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 GtQ[d, 0]
```

Rubi steps

$$\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt{1+a^2+2abx+b^2x^2}}\,dx = \frac{\text{Subst}\left(\int \frac{x^2\cot^{-1}(x)}{\sqrt{1+x^2}}\,dx, x, a+bx\right)}{b}$$

$$= \frac{(a+bx)\sqrt{1+(a+bx)^2}\cot^{-1}(a+bx)}{2b} + \frac{\text{Subst}\left(\int \frac{x}{\sqrt{1+x^2}}\,dx, x, a+bx\right)}{2b} - \frac{\text{Subst}\left(\int \frac{\cot^{-1}}{\sqrt{1}}\right.}{}$$

$$= \frac{\sqrt{1+(a+bx)^2}}{2b} + \frac{(a+bx)\sqrt{1+(a+bx)^2}\cot^{-1}(a+bx)}{2b} + \frac{i\cot^{-1}(a+bx)\tan^{-1}\left(\frac{\sqrt{1+i(a}}{\sqrt{1-i(a}}\right.}{b}$$

Mathematica [A] time = 1.4439, size = 202, normalized size = 1.08

$$-\frac{\sqrt{(a+bx)^2\left(\frac{1}{(a+bx)^2}+1\right)}\left(-4i\text{PolyLog}\left(2,-e^{i\cot^{-1}(a+bx)}\right)+4i\text{PolyLog}\left(2,e^{i\cot^{-1}(a+bx)}\right)-2\cot\left(\frac{1}{2}\cot^{-1}(a+bx)\right)-4\,\text{c}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^2*ArcCot[a + b*x])/Sqrt[1 + a^2 + 2*a*b*x + b^2*x^2],x
]
```

```
[Out] -(Sqrt[(a + b*x)^2*(1 + (a + b*x)^(-2))]*(-2*Cot[ArcCot[a + b*x]/2] - ArcCo
t[a + b*x]*Csc[ArcCot[a + b*x]/2]^2 - 4*ArcCot[a + b*x]*Log[1 - E^(I*ArcCot
[a + b*x])] + 4*ArcCot[a + b*x]*Log[1 + E^(I*ArcCot[a + b*x])] - (4*I)*Poly
Log[2, -E^(I*ArcCot[a + b*x])] + (4*I)*PolyLog[2, E^(I*ArcCot[a + b*x])] +
ArcCot[a + b*x]*Sec[ArcCot[a + b*x]/2]^2 - 2*Tan[ArcCot[a + b*x]/2]))/(8*b*
(a + b*x)*Sqrt[1 + (a + b*x)^(-2)])
```

Maple [A] time = 0.642, size = 167, normalized size = 0.9

$$\frac{\operatorname{arccot}(bx+a)\,xb+\operatorname{arccot}(bx+a)\,a+1}{2\,b}\sqrt{b^2x^2+2\,xab+a^2+1}-\frac{\operatorname{arccot}(bx+a)}{2\,b}\ln\left(1+(i+a+bx)\frac{1}{\sqrt{1+(bx+a)^2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x)
```

```
[Out] 1/2*(arccot(b*x+a)*x*b+arccot(b*x+a)*a+1)*(b^2*x^2+2*a*b*x+a^2+1)^(1/2)/b-1
/2/b*arccot(b*x+a)*ln(1+(I+a+b*x)/(1+(b*x+a)^2)^(1/2))+1/2/b*arccot(b*x+a)*
ln(1-(I+a+b*x)/(1+(b*x+a)^2)^(1/2))+1/2*I/b*polylog(2,-(I+a+b*x)/(1+(b*x+a)
^2)^(1/2))-1/2*I/b*polylog(2,(I+a+b*x)/(1+(b*x+a)^2)^(1/2))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x, algorith
m="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^2+2\,abx+a^2\right)\operatorname{arccot}\left(bx+a\right)}{\sqrt{b^2x^2+2\,abx+a^2+1}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x, algorith
m="fricas")
```

```
[Out] integral((b^2*x^2 + 2*a*b*x + a^2)*arccot(b*x + a)/sqrt(b^2*x^2 + 2*a*b*x +
 a^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+bx)^2\operatorname{acot}\left(a+bx\right)}{\sqrt{a^2+2abx+b^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*acot(b*x+a)/(b**2*x**2+2*a*b*x+a**2+1)**(1/2),x)
```

```
[Out] Integral((a + b*x)**2*acot(a + b*x)/sqrt(a**2 + 2*a*b*x + b**2*x**2 + 1), x
)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(bx+a)^2\operatorname{arccot}\left(bx+a\right)}{\sqrt{b^2x^2+2\,abx+a^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2),x, algorith
m="giac")
```

```
[Out] integrate((b*x + a)^2*arccot(b*x + a)/sqrt(b^2*x^2 + 2*a*b*x + a^2 + 1), x)
```

3.119 $\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt{(1+a^2)c+2abcx+b^2cx^2}} dx$

Optimal. Leaf size=281

$$\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b\sqrt{c(a+bx)^2+c}}-\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b\sqrt{c(a+bx)^2+c}}+\frac{\sqrt{c(a+bx)^2+c}}{2bc}+\frac{(a+bx)\sqrt{c(a\cdots}}{}$$

```
[Out] Sqrt[c + c*(a + b*x)^2]/(2*b*c) + ((a + b*x)*Sqrt[c + c*(a + b*x)^2]*ArcCot
[a + b*x])/(2*b*c) + (I*Sqrt[1 + (a + b*x)^2]*ArcCot[a + b*x]*ArcTan[Sqrt[1
 + I*(a + b*x)]/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2]) + ((I/2
)*Sqrt[1 + (a + b*x)^2]*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*
(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2]) - ((I/2)*Sqrt[1 + (a + b*x)^2]*Pol
yLog[2, (I*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a
+ b*x)^2])
```

Rubi [A] time = 0.3486, antiderivative size = 281, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {5058, 4953, 261, 4891, 4887}

$$\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,-\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b\sqrt{c(a+bx)^2+c}}-\frac{i\sqrt{(a+bx)^2+1}\text{PolyLog}\left(2,\frac{i\sqrt{1+i(a+bx)}}{\sqrt{1-i(a+bx)}}\right)}{2b\sqrt{c(a+bx)^2+c}}+\frac{\sqrt{c(a+bx)^2+c}}{2bc}+\frac{(a+bx)\sqrt{c(a\cdots}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^2*ArcCot[a + b*x])/Sqrt[(1 + a^2)*c + 2*a*b*c*x + b^2*c*x^2]
,x]
```


```
[Out] Sqrt[c + c*(a + b*x)^2]/(2*b*c) + ((a + b*x)*Sqrt[c + c*(a + b*x)^2]*ArcCot
[a + b*x])/(2*b*c) + (I*Sqrt[1 + (a + b*x)^2]*ArcCot[a + b*x]*ArcTan[Sqrt[1
 + I*(a + b*x)]/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2]) + ((I/2
)*Sqrt[1 + (a + b*x)^2]*PolyLog[2, ((-I)*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*
(a + b*x)]])/(b*Sqrt[c + c*(a + b*x)^2]) - ((I/2)*Sqrt[1 + (a + b*x)^2]*Pol
yLog[2, (I*Sqrt[1 + I*(a + b*x)])/Sqrt[1 - I*(a + b*x)]])/(b*Sqrt[c + c*(a
+ b*x)^2])
```


Rule 5058

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)^(q_.), x_Symbol] :> Dist[1/d, Subst
```

```
[Int[((d*e - c*f)/d + (f*x)/d)^m*(C/d^2 + (C*x^2)/d^2)^q*(a + b*ArcCot[x])^
p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m, p, q}, x] &&
 EqQ[B*(1 + c^2) - 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 4953

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcCot[c*x])^p)/(c^2*d*m), x] + (Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
+ b*ArcCot[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^2
*m), Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4891

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcCot[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4887

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcCot[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (-Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*
c*x])])/(c*Sqrt[d]), x] + Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
 I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 GtQ[d, 0]
```

Rubi steps

$$\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt{(1+a^2)\,c+2abcx+b^2cx^2}}\,dx = \frac{\text{Subst}\left(\int \frac{x^2\cot^{-1}(x)}{\sqrt{c+cx^2}}\,dx,x,a+bx\right)}{b}$$

$$= \frac{(a+bx)\sqrt{c+c(a+bx)^2}\cot^{-1}(a+bx)}{2bc} + \frac{\text{Subst}\left(\int \frac{x}{\sqrt{c+cx^2}}\,dx,x,a+bx\right)}{2b} - \frac{\text{Subst}\left(\right.}{}$$

$$= \frac{\sqrt{c+c(a+bx)^2}}{2bc} + \frac{(a+bx)\sqrt{c+c(a+bx)^2}\cot^{-1}(a+bx)}{2bc} - \frac{\sqrt{1+(a+bx)^2}\,\text{Subst}\left(\right.}{2b\sqrt{c+c}}$$

$$= \frac{\sqrt{c+c(a+bx)^2}}{2bc} + \frac{(a+bx)\sqrt{c+c(a+bx)^2}\cot^{-1}(a+bx)}{2bc} + \frac{i\sqrt{1+(a+bx)^2}\cot^{-1}(}{b\sqrt{c+}}$$

Mathematica [A] time = 0.900675, size = 207, normalized size = 0.74

$$-\frac{\sqrt{c\left(a^2+2abx+b^2x^2+1\right)}\left(-4i\text{PolyLog}\left(2,-e^{i\cot^{-1}(a+bx)}\right)+4i\text{PolyLog}\left(2,e^{i\cot^{-1}(a+bx)}\right)-2\cot\left(\frac{1}{2}\cot^{-1}(a+bx)\right)-4\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^2*ArcCot[a + b*x])/Sqrt[(1 + a^2)*c + 2*a*b*c*x + b^2*
c*x^2],x]
```

```
[Out] -(Sqrt[c*(1 + a^2 + 2*a*b*x + b^2*x^2)]*(-2*Cot[ArcCot[a + b*x]/2] - ArcCot
[a + b*x]*Csc[ArcCot[a + b*x]/2]^2 - 4*ArcCot[a + b*x]*Log[1 - E^(I*ArcCot[
a + b*x])] + 4*ArcCot[a + b*x]*Log[1 + E^(I*ArcCot[a + b*x])] - (4*I)*PolyL
og[2, -E^(I*ArcCot[a + b*x])] + (4*I)*PolyLog[2, E^(I*ArcCot[a + b*x])] + A
rcCot[a + b*x]*Sec[ArcCot[a + b*x]/2]^2 - 2*Tan[ArcCot[a + b*x]/2]))/(8*b*c
*(a + b*x)*Sqrt[1 + (a + b*x)^(-2)])
```

Maple [A] time = 1.1, size = 202, normalized size = 0.7

$$\frac{\text{arccot}\,(bx+a)\,xb+\text{arccot}\,(bx+a)\,a+1}{2\,cb}\sqrt{c\,(-i+a+bx)\,(i+a+bx)}-\frac{\frac{i}{2}}{cb}\left(i\text{arccot}\,(bx+a)\ln\left(1-(i+a+bx)\frac{1}{\sqrt{1+(b}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+b^2*c*x^2)^(1/2),x)
```

```
[Out] 1/2*(arccot(b*x+a)*x*b+arccot(b*x+a)*a+1)*(c*(-I+a+b*x)*(I+a+b*x))^(1/2)/c/
b-1/2*I*(I*arccot(b*x+a)*ln(1-(I+a+b*x)/(1+(b*x+a)^2)^(1/2))-I*arccot(b*x+a
)*ln(1+(I+a+b*x)/(1+(b*x+a)^2)^(1/2))-polylog(2,-(I+a+b*x)/(1+(b*x+a)^2)^(1
/2))+polylog(2,(I+a+b*x)/(1+(b*x+a)^2)^(1/2)))*(c*(-I+a+b*x)*(I+a+b*x))^(1/
2)/(b^2*x^2+2*a*b*x+a^2+1)^(1/2)/b/c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/2),x,
algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^2 + 2\,abx + a^2\right)\text{arccot}\,(bx + a)}{\sqrt{b^2cx^2 + 2\,abcx + \left(a^2 + 1\right)c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/2),x,
algorithm="fricas")
```

```
[Out] integral((b^2*x^2 + 2*a*b*x + a^2)*arccot(b*x + a)/sqrt(b^2*c*x^2 + 2*a*b*c
*x + (a^2 + 1)*c), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*acot(b*x+a)/((a**2+1)*c+2*a*b*c*x+c*x**2*b**2)**(1/2),
x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2 \operatorname{arccot}(bx+a)}{\sqrt{b^2cx^2+2\,abcx+(a^2+1)c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/2),x,
algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*arccot(b*x + a)/sqrt(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1
)*c), x)
```

3.120 $\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{1+a^2+2abx+b^2x^2}} \, dx$

Optimal. Leaf size=29

$$\text{Unintegrable}\left(\frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{(a+bx)^2+1}}, x\right)$$

```
[Out] Unintegrable[((a + b*x)^2*ArcCot[a + b*x])/(1 + (a + b*x)^2)^(1/3), x]
```

Rubi [A] time = 0.137071, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{1+a^2+2abx+b^2x^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[((a + b*x)^2*ArcCot[a + b*x])/(1 + a^2 + 2*a*b*x + b^2*x^2)^(1/3),x]
```

```
[Out] Defer[Subst][Defer[Int][(x^2*ArcCot[x])/(1 + x^2)^(1/3), x], x, a + b*x]/b
```

Rubi steps

$$\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{1+a^2+2abx+b^2x^2}} \, dx = \frac{\text{Subst}\left(\int \frac{x^2 \cot^{-1}(x)}{\sqrt[3]{1+x^2}} \, dx, x, a+bx\right)}{b}$$

Mathematica [A] time = 0.920116, size = 198, normalized size = 6.83

$$\frac{3\left(5\sqrt[3]{2}\sqrt{\pi}\text{Gamma}\left(\frac{5}{3}\right)\text{HypergeometricPFQ}\left(\left\{1,\frac{4}{3},\frac{4}{3}\right\},\left\{\frac{11}{6},\frac{7}{3}\right\},\frac{1}{a^2+2abx+b^2x^2+1}\right)+\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(5\left((a\right.\right.\right.}{140b\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^2*ArcCot[a + b*x])/(1 + a^2 + 2*a*b*x + b^2*x^2)^(1/3)
,x]
```

```
[Out] (3*(Gamma[11/6]*Gamma[7/3]*(5*(1 + (a + b*x)^2)*(3*(7 + (a + b*x)^2) + 4*(a
 + b*x)*(-2 + (a + b*x)^2)*ArcCot[a + b*x]) - 24*(a + b*x)*ArcCot[a + b*x]*
Hypergeometric2F1[1, 4/3, 11/6, (1 + a^2 + 2*a*b*x + b^2*x^2)^(-1)]) + 5*2^
(1/3)*Sqrt[Pi]*Gamma[5/3]*HypergeometricPFQ[{1, 4/3, 4/3}, {11/6, 7/3}, (1
+ a^2 + 2*a*b*x + b^2*x^2)^(-1)]))/(140*b*(1 + a^2 + 2*a*b*x + b^2*x^2)^(1/
3)*(1 + (a + b*x)^2)*Gamma[11/6]*Gamma[7/3])
```

Maple [A] time = 1.473, size = 0, normalized size = 0.

$$\int (bx+a)^2 \operatorname{arccot}(bx+a) \frac{1}{\sqrt[3]{b^2x^2+2xab+a^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x)
```

```
[Out] int((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2 \operatorname{arccot}(bx+a)}{\left(b^2x^2+2\,abx+a^2+1\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x, algorith
m="maxima")
```

```
[Out] integrate((b*x + a)^2*arccot(b*x + a)/(b^2*x^2 + 2*a*b*x + a^2 + 1)^(1/3),
x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\left(b^2x^2+2\,abx+a^2\right)\operatorname{arccot}(bx+a)}{\left(b^2x^2+2\,abx+a^2+1\right)^{\frac{1}{3}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x, algorith
m="fricas")
```

```
[Out] integral((b^2*x^2 + 2*a*b*x + a^2)*arccot(b*x + a)/(b^2*x^2 + 2*a*b*x + a^2
 + 1)^(1/3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+bx)^2 \operatorname{acot}(a+bx)}{\sqrt[3]{a^2+2abx+b^2x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*acot(b*x+a)/(b**2*x**2+2*a*b*x+a**2+1)**(1/3),x)
```

```
[Out] Integral((a + b*x)**2*acot(a + b*x)/(a**2 + 2*a*b*x + b**2*x**2 + 1)**(1/3)
, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2 \operatorname{arccot}(bx+a)}{\left(b^2x^2+2\,abx+a^2+1\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/(b^2*x^2+2*a*b*x+a^2+1)^(1/3),x, algorith
m="giac")
```

```
[Out] integrate((b*x + a)^2*arccot(b*x + a)/(b^2*x^2 + 2*a*b*x + a^2 + 1)^(1/3),
x)
```

3.121 $\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{\left(1+a^2\right)c+2abcx+b^2cx^2}}\,dx$

Optimal. Leaf size=31

$$\text{Unintegrable}\left(\frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{c(a+bx)^2+c}},x\right)$$

```
[Out] Unintegrable[((a + b*x)^2*ArcCot[a + b*x])/(c + c*(a + b*x)^2)^(1/3), x]
```

Rubi [A] time = 0.189707, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{\left(1+a^2\right)c+2abcx+b^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a + b*x)^2*ArcCot[a + b*x])/((1 + a^2)*c + 2*a*b*c*x + b^2*c*x^2)^(1/
3),x]
```

```
[Out] Defer[Subst][Defer[Int][(x^2*ArcCot[x])/(c + c*x^2)^(1/3), x], x, a + b*x]/
b
```

Rubi steps

$$\int \frac{(a+bx)^2 \cot^{-1}(a+bx)}{\sqrt[3]{\left(1+a^2\right)c+2abcx+b^2cx^2}}\,dx=\frac{\text{Subst}\left(\int \frac{x^2 \cot^{-1}(x)}{\sqrt[3]{c+cx^2}}\,dx,x,a+bx\right)}{b}$$

Mathematica [A] time = 0.204658, size = 200, normalized size = 6.45

$$\frac{3\left(5\sqrt[3]{2}\sqrt{\pi}\text{Gamma}\left(\frac{5}{3}\right)\text{HypergeometricPFQ}\left(\left\{1,\frac{4}{3},\frac{4}{3}\right\},\left\{\frac{11}{6},\frac{7}{3}\right\},\frac{1}{a^2+2abx+b^2x^2+1}\right)+\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(5\left((a+\right.\right.\right.}{140b\text{Gamma}\left(\frac{11}{6}\right)\text{Gamma}\left(\frac{7}{3}\right)\left(\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^2*ArcCot[a + b*x])/((1 + a^2)*c + 2*a*b*c*x + b^2*c*x^
2)^(1/3),x]
```

```
[Out] (3*(Gamma[11/6]*Gamma[7/3]*(5*(1 + (a + b*x)^2)*(3*(7 + (a + b*x)^2) + 4*(a
 + b*x)*(-2 + (a + b*x)^2)*ArcCot[a + b*x]) - 24*(a + b*x)*ArcCot[a + b*x]*
Hypergeometric2F1[1, 4/3, 11/6, (1 + a^2 + 2*a*b*x + b^2*x^2)^(-1)]) + 5*2^
(1/3)*Sqrt[Pi]*Gamma[5/3]*HypergeometricPFQ[{1, 4/3, 4/3}, {11/6, 7/3}, (1
+ a^2 + 2*a*b*x + b^2*x^2)^(-1)]))/(140*b*(c*(1 + a^2 + 2*a*b*x + b^2*x^2))
^(1/3)*(1 + (a + b*x)^2)*Gamma[11/6]*Gamma[7/3])
```

Maple [A] time = 1.456, size = 0, normalized size = 0.

$$\int (bx+a)^2 \operatorname{arccot}(bx+a) \frac{1}{\sqrt[3]{(a^2+1)\,c+2\,abcx+b^2cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+b^2*c*x^2)^(1/3),x)
```

```
[Out] int((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+b^2*c*x^2)^(1/3),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^2 \operatorname{arccot}(bx+a)}{\left(b^2cx^2+2\,abcx+(a^2+1)c\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/3),x,
algorithm="maxima")
```

```
[Out] integrate((b*x + a)^2*arccot(b*x + a)/(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c)
^(1/3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(b^2x^2+2\,abx+a^2\right)\operatorname{arccot}\left(bx+a\right)}{\left(b^2cx^2+2\,abcx+\left(a^2+1\right)c\right)^{\frac{1}{3}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/3),x,
algorithm="fricas")
```

```
[Out] integral((b^2*x^2 + 2*a*b*x + a^2)*arccot(b*x + a)/(b^2*c*x^2 + 2*a*b*c*x +
 (a^2 + 1)*c)^(1/3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*acot(b*x+a)/((a**2+1)*c+2*a*b*c*x+c*x**2*b**2)**(1/3),
x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(bx+a\right)^2\operatorname{arccot}\left(bx+a\right)}{\left(b^2cx^2+2\,abcx+\left(a^2+1\right)c\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)/((a^2+1)*c+2*a*b*c*x+c*x^2*b^2)^(1/3),x,
algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*arccot(b*x + a)/(b^2*c*x^2 + 2*a*b*c*x + (a^2 + 1)*c)
^(1/3), x)
```

3.122 $\int (a+bx)^2 \cot^{-1}(a+bx)\,dx$

Optimal. Leaf size=52

$$\frac{(a+bx)^2}{6b}-\frac{\log\left((a+bx)^2+1\right)}{6b}+\frac{(a+bx)^3\cot^{-1}(a+bx)}{3b}$$

```
[Out] (a + b*x)^2/(6*b) + ((a + b*x)^3*ArcCot[a + b*x])/(3*b) - Log[1 + (a + b*x)
^2]/(6*b)
```

Rubi [A] time = 0.0386925, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {5044, 4853, 266, 43}

$$\frac{(a+bx)^2}{6b}-\frac{\log\left((a+bx)^2+1\right)}{6b}+\frac{(a+bx)^3\cot^{-1}(a+bx)}{3b}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^2*ArcCot[a + b*x],x]
```

```
[Out] (a + b*x)^2/(6*b) + ((a + b*x)^3*ArcCot[a + b*x])/(3*b) - Log[1 + (a + b*x)
^2]/(6*b)
```

Rule 5044

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((f*x)/d)^m*(a + b*ArcCot[x])^p, x],
x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[d*e - c*f, 0] &&
IGtQ[p, 0]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int (a+bx)^2 \cot^{-1}(a+bx)\,dx &= \frac{\text{Subst}\left(\int x^2 \cot^{-1}(x)\,dx, x, a+bx\right)}{b}\\
&= \frac{(a+bx)^3 \cot^{-1}(a+bx)}{3b} + \frac{\text{Subst}\left(\int \frac{x^3}{1+x^2}\,dx, x, a+bx\right)}{3b}\\
&= \frac{(a+bx)^3 \cot^{-1}(a+bx)}{3b} + \frac{\text{Subst}\left(\int \frac{x}{1+x}\,dx, x, (a+bx)^2\right)}{6b}\\
&= \frac{(a+bx)^3 \cot^{-1}(a+bx)}{3b} + \frac{\text{Subst}\left(\int \left(1+\frac{1}{-1-x}\right)dx, x, (a+bx)^2\right)}{6b}\\
&= \frac{(a+bx)^2}{6b} + \frac{(a+bx)^3 \cot^{-1}(a+bx)}{3b} - \frac{\log\left(1+(a+bx)^2\right)}{6b}
\end{aligned}
$$

Mathematica [A] time = 0.0136469, size = 42, normalized size = 0.81

$$
\frac{(a+bx)^2 - \log\left((a+bx)^2+1\right) + 2(a+bx)^3 \cot^{-1}(a+bx)}{6b}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*ArcCot[a + b*x],x]
```

```
[Out] ((a + b*x)^2 + 2*(a + b*x)^3*ArcCot[a + b*x] - Log[1 + (a + b*x)^2])/(6*b)
```

Maple [A] time = 0.042, size = 86, normalized size = 1.7

$$
\frac{b^2 \text{arccot}\,(bx+a)\,x^3}{3} + b\text{arccot}\,(bx+a)\,x^2 a + \text{arccot}\,(bx+a)\,x a^2 + \frac{\text{arccot}\,(bx+a)\,a^3}{3\,b} + \frac{bx^2}{6} + \frac{ax}{3} + \frac{a^2}{6\,b} - \frac{\ln\left(1+(bx\right.}{6\,b}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*arccot(b*x+a),x)
```

```
[Out] 1/3*b^2*arccot(b*x+a)*x^3+b*arccot(b*x+a)*x^2*a+arccot(b*x+a)*x*a^2+1/3/b*a
rccot(b*x+a)*a^3+1/6*b*x^2+1/3*a*x+1/6/b*a^2-1/6*ln(1+(b*x+a)^2)/b
```

Maxima [B] time = 1.47172, size = 126, normalized size = 2.42

$$-\frac{1}{6}\left(\frac{2\,a^{3}\arctan\left(\frac{b^{2}x+ab}{b}\right)}{b^{2}}-\frac{bx^{2}+2\,ax}{b}+\frac{\log\left(b^{2}x^{2}+2\,abx+a^{2}+1\right)}{b^{2}}\right)b+\frac{1}{3}\left(b^{2}x^{3}+3\,abx^{2}+3\,a^{2}x\right)\operatorname{arccot}\left(bx+a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a),x, algorithm="maxima")
```

```
[Out] -1/6*(2*a^3*arctan((b^2*x + a*b)/b)/b^2 - (b*x^2 + 2*a*x)/b + log(b^2*x^2 +
 2*a*b*x + a^2 + 1)/b^2)*b + 1/3*(b^2*x^3 + 3*a*b*x^2 + 3*a^2*x)*arccot(b*x
 + a)
```

Fricas [A] time = 2.1865, size = 192, normalized size = 3.69

$$\frac{b^{2}x^{2}-2\,a^{3}\arctan\left(bx+a\right)+2\,abx+2\left(b^{3}x^{3}+3\,ab^{2}x^{2}+3\,a^{2}bx\right)\operatorname{arccot}\left(bx+a\right)-\log\left(b^{2}x^{2}+2\,abx+a^{2}+1\right)}{6\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/6*(b^2*x^2 - 2*a^3*arctan(b*x + a) + 2*a*b*x + 2*(b^3*x^3 + 3*a*b^2*x^2 +
 3*a^2*b*x)*arccot(b*x + a) - log(b^2*x^2 + 2*a*b*x + a^2 + 1))/b
```

Sympy [A] time = 1.67135, size = 100, normalized size = 1.92

$$\begin{cases}\frac{a^{3}\operatorname{acot}(a+bx)}{3b}+a^{2}x\operatorname{acot}\left(a+bx\right)+abx^{2}\operatorname{acot}\left(a+bx\right)+\frac{ax}{3}+\frac{b^{2}x^{3}\operatorname{acot}(a+bx)}{3}+\frac{bx^{2}}{6}-\frac{\log\left(\frac{a^{2}}{b^{2}}+\frac{2ax}{b}+x^{2}+\frac{1}{b^{2}}\right)}{6b} & \text{for}\: b\neq 0\\ a^{2}x\operatorname{acot}\left(a\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*acot(b*x+a),x)
```

```
[Out] Piecewise((a**3*acot(a + b*x)/(3*b) + a**2*x*acot(a + b*x) + a*b*x**2*acot(
a + b*x) + a*x/3 + b**2*x**3*acot(a + b*x)/3 + b*x**2/6 - log(a**2/b**2 + 2
*a*x/b + x**2 + b**(-2))/(6*b), Ne(b, 0)), (a**2*x*acot(a), True))
```

Giac [A] time = 1.10006, size = 86, normalized size = 1.65

$$\frac{(bx+a)^3 \arctan\left(\frac{1}{bx+a}\right)}{3\,b} - \frac{\log\left(b^2x^2 + 2\,abx + a^2 + 1\right)}{6\,b} + \frac{b^5x^2 + 2\,ab^4x}{6\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a),x, algorithm="giac")
```

```
[Out] 1/3*(b*x + a)^3*arctan(1/(b*x + a))/b - 1/6*log(b^2*x^2 + 2*a*b*x + a^2 + 1
)/b + 1/6*(b^5*x^2 + 2*a*b^4*x)/b^4
```

3.123 $\int (a+bx)\cot^{-1}(a+bx)\,dx$

Optimal. Leaf size=39

$$-\frac{\tan^{-1}(a+bx)}{2b}+\frac{(a+bx)^2\cot^{-1}(a+bx)}{2b}+\frac{x}{2}$$

```
[Out] x/2 + ((a + b*x)^2*ArcCot[a + b*x])/(2*b) - ArcTan[a + b*x]/(2*b)
```

Rubi [A] time = 0.0209446, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5044, 4853, 321, 203}

$$-\frac{\tan^{-1}(a+bx)}{2b}+\frac{(a+bx)^2\cot^{-1}(a+bx)}{2b}+\frac{x}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)*ArcCot[a + b*x],x]
```

```
[Out] x/2 + ((a + b*x)^2*ArcCot[a + b*x])/(2*b) - ArcTan[a + b*x]/(2*b)
```

Rule 5044

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((f*x)/d)^m*(a + b*ArcCot[x])^p, x],
x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[d*e - c*f, 0] &&
IGtQ[p, 0]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
+ 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int (a+bx)\cot^{-1}(a+bx)\,dx &= \frac{\text{Subst}\left(\int x\cot^{-1}(x)\,dx,x,a+bx\right)}{b}\\ &= \frac{(a+bx)^2\cot^{-1}(a+bx)}{2b}+\frac{\text{Subst}\left(\int \frac{x^2}{1+x^2}\,dx,x,a+bx\right)}{2b}\\ &= \frac{x}{2}+\frac{(a+bx)^2\cot^{-1}(a+bx)}{2b}-\frac{\text{Subst}\left(\int \frac{1}{1+x^2}\,dx,x,a+bx\right)}{2b}\\ &= \frac{x}{2}+\frac{(a+bx)^2\cot^{-1}(a+bx)}{2b}-\frac{\tan^{-1}(a+bx)}{2b}\end{aligned}$$

Mathematica [C] time = 0.0548926, size = 141, normalized size = 3.62

$$\frac{a\left(\log\left(a^2+2abx+b^2x^2+1\right)-2a\tan^{-1}(a+bx)\right)}{2b}+\frac{1}{2}b\left(-\frac{i(-a+i)^2\log(-a-bx+i)}{2b^2}+\frac{i(a+i)^2\log(a+bx+i)}{2b^2}+\frac{x}{b}\right)+$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)*ArcCot[a + b*x],x]
```

```
[Out] a*x*ArcCot[a + b*x] + (b*(-(a/b) + (a + b*x)/b)^2*ArcCot[a + b*x])/2 + (b*(
x/b - ((I/2)*(I - a)^2*Log[I - a - b*x])/b^2 + ((I/2)*(I + a)^2*Log[I + a +
 b*x])/b^2))/2 + (a*(-2*a*ArcTan[a + b*x] + Log[1 + a^2 + 2*a*b*x + b^2*x^2
]))/(2*b)
```

Maple [A] time = 0.043, size = 57, normalized size = 1.5

$$\frac{b\operatorname{arccot}(bx+a)\,x^2}{2}+\operatorname{arccot}(bx+a)\,xa+\frac{\operatorname{arccot}(bx+a)\,a^2}{2\,b}+\frac{x}{2}+\frac{a}{2\,b}-\frac{\arctan(bx+a)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*arccot(b*x+a),x)
```

```
[Out] 1/2*b*arccot(b*x+a)*x^2+arccot(b*x+a)*x*a+1/2/b*arccot(b*x+a)*a^2+1/2*x+1/2
*a/b-1/2*arctan(b*x+a)/b
```

Maxima [A] time = 1.45168, size = 70, normalized size = 1.79

$$\frac{1}{2}\,b\left(\frac{x}{b}-\frac{\left(a^2+1\right)\arctan\left(\frac{b^2x+ab}{b}\right)}{b^2}\right)+\frac{1}{2}\left(bx^2+2\,ax\right)\operatorname{arccot}\left(bx+a\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*arccot(b*x+a),x, algorithm="maxima")
```

```
[Out] 1/2*b*(x/b - (a^2 + 1)*arctan((b^2*x + a*b)/b)/b^2) + 1/2*(b*x^2 + 2*a*x)*a
rccot(b*x + a)
```

Fricas [A] time = 2.10774, size = 82, normalized size = 2.1

$$\frac{bx+\left(b^2x^2+2\,abx+a^2+1\right)\operatorname{arccot}\left(bx+a\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*arccot(b*x+a),x, algorithm="fricas")
```

```
[Out] 1/2*(b*x + (b^2*x^2 + 2*a*b*x + a^2 + 1)*arccot(b*x + a))/b
```

Sympy [A] time = 1.07128, size = 56, normalized size = 1.44

$$\begin{cases}\frac{a^2\operatorname{acot}(a+bx)}{2b}+ax\operatorname{acot}(a+bx)+\frac{bx^2\operatorname{acot}(a+bx)}{2}+\frac{x}{2}+\frac{\operatorname{acot}(a+bx)}{2b} & \text{for}\ b\neq 0\\ ax\operatorname{acot}(a) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*acot(b*x+a),x)
```

```
[Out] Piecewise((a**2*acot(a + b*x)/(2*b) + a*x*acot(a + b*x) + b*x**2*acot(a + b
*x)/2 + x/2 + acot(a + b*x)/(2*b), Ne(b, 0)), (a*x*acot(a), True))
```

Giac [A] time = 1.11124, size = 54, normalized size = 1.38

$$\frac{1}{2}\left(bx^2 + 2\,ax\right)\arctan\left(\frac{1}{bx + a}\right) + \frac{1}{2}\,x - \frac{\left(a^2 + 1\right)\arctan\left(bx + a\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*arccot(b*x+a),x, algorithm="giac")
```

```
[Out] 1/2*(b*x^2 + 2*a*x)*arctan(1/(b*x + a)) + 1/2*x - 1/2*(a^2 + 1)*arctan(b*x
+ a)/b
```

3.124 $\int \frac{\cot^{-1}(a+bx)}{a+bx} dx$

Optimal. Leaf size=45

$$\frac{i\text{PolyLog}\left(2,\frac{i}{a+bx}\right)}{2b}-\frac{i\text{PolyLog}\left(2,-\frac{i}{a+bx}\right)}{2b}$$

```
[Out] ((-I/2)*PolyLog[2, (-I)/(a + b*x)])/b + ((I/2)*PolyLog[2, I/(a + b*x)])/b
```

Rubi [A] time = 0.0414755, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {5044, 4849, 2391}

$$\frac{i\text{PolyLog}\left(2,\frac{i}{a+bx}\right)}{2b}-\frac{i\text{PolyLog}\left(2,-\frac{i}{a+bx}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/(a + b*x),x]
```

```
[Out] ((-I/2)*PolyLog[2, (-I)/(a + b*x)])/b + ((I/2)*PolyLog[2, I/(a + b*x)])/b
```

Rule 5044

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((f*x)/d)^m*(a + b*ArcCot[x])^p, x],
x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[d*e - c*f, 0] &&
IGtQ[p, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{a+bx}\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{x}\,dx, x, a+bx\right)}{b}$$
$$= \frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x}\,dx, x, a+bx\right)}{2b} - \frac{i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x}\,dx, x, a+bx\right)}{2b}$$
$$= -\frac{i\text{Li}_2\left(-\frac{i}{a+bx}\right)}{2b} + \frac{i\text{Li}_2\left(\frac{i}{a+bx}\right)}{2b}$$

Mathematica [A] time = 0.0068087, size = 38, normalized size = 0.84

$$-\frac{i\left(\text{PolyLog}\left(2,-\frac{i}{a+bx}\right)-\text{PolyLog}\left(2,\frac{i}{a+bx}\right)\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/(a + b*x),x]

[Out] ((-I/2)*(PolyLog[2, (-I)/(a + b*x)] - PolyLog[2, I/(a + b*x)]))/b
```

Maple [B] time = 0.052, size = 98, normalized size = 2.2

$$\frac{\ln(bx+a)\,\text{arccot}\,(bx+a)}{b} - \frac{\frac{i}{2}\ln(bx+a)\ln(1+i(bx+a))}{b} + \frac{\frac{i}{2}\ln(bx+a)\ln(1-i(bx+a))}{b} - \frac{\frac{i}{2}\text{dilog}\,(1+i(bx+a))}{b} +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(b*x+a),x)

[Out] 1/b*ln(b*x+a)*arccot(b*x+a)-1/2*I/b*ln(b*x+a)*ln(1+I*(b*x+a))+1/2*I/b*ln(b*
x+a)*ln(1-I*(b*x+a))-1/2*I/b*dilog(1+I*(b*x+a))+1/2*I/b*dilog(1-I*(b*x+a))
```

Maxima [B] time = 1.63219, size = 151, normalized size = 3.36

$$\frac{\operatorname{arccot}(bx+a)\log(bx+a)}{b}+\frac{\arctan\left(\frac{b^2x+ab}{b}\right)\log(bx+a)}{b}+\frac{\arctan(bx+a,0)\log\left(b^2x^2+2\,abx+a^2+1\right)-2\ \operatorname{arctan}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b*x+a),x, algorithm="maxima")
```

```
[Out] arccot(b*x + a)*log(b*x + a)/b + arctan((b^2*x + a*b)/b)*log(b*x + a)/b + 1
/2*(arctan2(b*x + a, 0)*log(b^2*x^2 + 2*a*b*x + a^2 + 1) - 2*arctan(b*x + a
)*log(abs(b*x + a)) + I*dilog(I*b*x + I*a + 1) - I*dilog(-I*b*x - I*a + 1))
/b
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(bx+a)}{bx+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b*x+a),x, algorithm="fricas")
```

```
[Out] integral(arccot(b*x + a)/(b*x + a), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\operatorname{acot}(a+bx)}{a+bx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(b*x+a),x)
```

```
[Out] Integral(acot(a + b*x)/(a + b*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b*x+a),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(b*x + a), x)
```

3.125 $\int \frac{\cot^{-1}(a+bx)}{(a+bx)^2}\,dx$

Optimal. Leaf size=47

$$-\frac{\log(a+bx)}{b}+\frac{\log\left((a+bx)^2+1\right)}{2b}-\frac{\cot^{-1}(a+bx)}{b(a+bx)}$$

```
[Out] -(ArcCot[a + b*x]/(b*(a + b*x))) - Log[a + b*x]/b + Log[1 + (a + b*x)^2]/(2
*b)
```

Rubi [A] time = 0.0316369, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {5044, 4853, 266, 36, 29, 31}

$$-\frac{\log(a+bx)}{b}+\frac{\log\left((a+bx)^2+1\right)}{2b}-\frac{\cot^{-1}(a+bx)}{b(a+bx)}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/(a + b*x)^2,x]
```

```
[Out] -(ArcCot[a + b*x]/(b*(a + b*x))) - Log[a + b*x]/b + Log[1 + (a + b*x)^2]/(2
*b)
```

Rule 5044

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((f*x)/d)^m*(a + b*ArcCot[x])^p, x],
x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[d*e - c*f, 0] &&
IGtQ[p, 0]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}(a+bx)}{(a+bx)^2}\,dx &= \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{x^2}\,dx, x, a+bx\right)}{b}\\
&= -\frac{\cot^{-1}(a+bx)}{b(a+bx)} - \frac{\text{Subst}\left(\int \frac{1}{x\left(1+x^2\right)}\,dx, x, a+bx\right)}{b}\\
&= -\frac{\cot^{-1}(a+bx)}{b(a+bx)} - \frac{\text{Subst}\left(\int \frac{1}{x(1+x)}\,dx, x, (a+bx)^2\right)}{2b}\\
&= -\frac{\cot^{-1}(a+bx)}{b(a+bx)} - \frac{\text{Subst}\left(\int \frac{1}{x}\,dx, x, (a+bx)^2\right)}{2b} + \frac{\text{Subst}\left(\int \frac{1}{1+x}\,dx, x, (a+bx)^2\right)}{2b}\\
&= -\frac{\cot^{-1}(a+bx)}{b(a+bx)} - \frac{\log(a+bx)}{b} + \frac{\log\left(1+(a+bx)^2\right)}{2b}
\end{aligned}$$

Mathematica [A] time = 0.0174963, size = 40, normalized size = 0.85

$$-\frac{\log(a+bx) - \frac{1}{2}\log\left((a+bx)^2+1\right) + \frac{\cot^{-1}(a+bx)}{a+bx}}{b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/(a + b*x)^2,x]
```

```
[Out] -((ArcCot[a + b*x]/(a + b*x) + Log[a + b*x] - Log[1 + (a + b*x)^2]/2)/b)
```

Maple [A] time = 0.046, size = 46, normalized size = 1.

$$-\frac{\operatorname{arccot}(bx+a)}{b(bx+a)}-\frac{\ln(bx+a)}{b}+\frac{\ln\left(1+(bx+a)^2\right)}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(b*x+a)^2,x)
```

```
[Out] -arccot(b*x+a)/b/(b*x+a)-ln(b*x+a)/b+1/2*ln(1+(b*x+a)^2)/b
```

Maxima [A] time = 1.00666, size = 72, normalized size = 1.53

$$\frac{\log\left(b^2x^2+2\,abx+a^2+1\right)}{2\,b}-\frac{\log(bx+a)}{b}-\frac{\operatorname{arccot}(bx+a)}{(bx+a)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b*x+a)^2,x, algorithm="maxima")
```

```
[Out] 1/2*log(b^2*x^2 + 2*a*b*x + a^2 + 1)/b - log(b*x + a)/b - arccot(b*x + a)/(
(b*x + a)*b)
```

Fricas [A] time = 2.22231, size = 150, normalized size = 3.19

$$\frac{(bx+a)\log\left(b^2x^2+2\,abx+a^2+1\right)-2\,(bx+a)\log(bx+a)-2\,\operatorname{arccot}(bx+a)}{2\left(b^2x+ab\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b*x+a)^2,x, algorithm="fricas")
```

```
[Out] 1/2*((b*x + a)*log(b^2*x^2 + 2*a*b*x + a^2 + 1) - 2*(b*x + a)*log(b*x + a)
- 2*arccot(b*x + a))/(b^2*x + a*b)
```

Sympy [A] time = 1.96155, size = 150, normalized size = 3.19

$$\begin{cases} -\frac{2a\log\left(\frac{a}{b}+x\right)}{2ab+2b^2x} + \frac{a\log\left(\frac{a^2}{b^2}+\frac{2ax}{b}+x^2+\frac{1}{b^2}\right)}{2ab+2b^2x} - \frac{2bx\log\left(\frac{a}{b}+x\right)}{2ab+2b^2x} + \frac{bx\log\left(\frac{a^2}{b^2}+\frac{2ax}{b}+x^2+\frac{1}{b^2}\right)}{2ab+2b^2x} - \frac{2\operatorname{acot}(a+bx)}{2ab+2b^2x} & \text{for } b \neq 0 \\ \frac{x\operatorname{acot}(a)}{a^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(b*x+a)**2,x)
```

```
[Out] Piecewise((-2*a*log(a/b + x)/(2*a*b + 2*b**2*x) + a*log(a**2/b**2 + 2*a*x/b
 + x**2 + b**(-2))/(2*a*b + 2*b**2*x) - 2*b*x*log(a/b + x)/(2*a*b + 2*b**2*
x) + b*x*log(a**2/b**2 + 2*a*x/b + x**2 + b**(-2))/(2*a*b + 2*b**2*x) - 2*a
cot(a + b*x)/(2*a*b + 2*b**2*x), Ne(b, 0)), (x*acot(a)/a**2, True))
```

Giac [A] time = 1.10879, size = 49, normalized size = 1.04

$$\frac{\log\left(\frac{1}{(bx+a)^2}+1\right)}{2\,b} - \frac{\arctan\left(\frac{1}{bx+a}\right)}{(bx+a)b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(b*x+a)^2,x, algorithm="giac")
```

```
[Out] 1/2*log(1/(b*x + a)^2 + 1)/b - arctan(1/(b*x + a))/((b*x + a)*b)
```

3.126 $\int \frac{\cot^{-1}(1+x)}{2+2x}\,dx$

Optimal. Leaf size=35

$$\frac{1}{4}i\text{PolyLog}\left(2,\frac{i}{x+1}\right)-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{i}{x+1}\right)$$

```
[Out] (-I/4)*PolyLog[2, (-I)/(1 + x)] + (I/4)*PolyLog[2, I/(1 + x)]
```

Rubi [A] time = 0.036544, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5044, 12, 4849, 2391}

$$\frac{1}{4}i\text{PolyLog}\left(2,\frac{i}{x+1}\right)-\frac{1}{4}i\text{PolyLog}\left(2,-\frac{i}{x+1}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[1 + x]/(2 + 2*x),x]
```

```
[Out] (-I/4)*PolyLog[2, (-I)/(1 + x)] + (I/4)*PolyLog[2, I/(1 + x)]
```

Rule 5044

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((f*x)/d)^m*(a + b*ArcCot[x])^p, x],
x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[d*e - c*f, 0] &&
IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot^{-1}(1+x)}{2+2x}\,dx &= \text{Subst}\left(\int \frac{\cot^{-1}(x)}{2x}\,dx, x, 1+x\right)\\
&= \frac{1}{2}\,\text{Subst}\left(\int \frac{\cot^{-1}(x)}{x}\,dx, x, 1+x\right)\\
&= \frac{1}{4} i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x}\,dx, x, 1+x\right) - \frac{1}{4} i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x}\,dx, x, 1+x\right)\\
&= -\frac{1}{4} i \text{Li}_2\left(-\frac{i}{1+x}\right) + \frac{1}{4} i \text{Li}_2\left(\frac{i}{1+x}\right)
\end{aligned}$$

Mathematica [A] time = 0.0043733, size = 35, normalized size = 1.

$$\frac{1}{4} i \text{PolyLog}\left(2, \frac{i}{x+1}\right) - \frac{1}{4} i \text{PolyLog}\left(2, -\frac{i}{x+1}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[1 + x]/(2 + 2*x),x]
```

```
[Out] (-I/4)*PolyLog[2, (-I)/(1 + x)] + (I/4)*PolyLog[2, I/(1 + x)]
```

Maple [B] time = 0.036, size = 68, normalized size = 1.9

$$\frac{\ln(x+1)\,\text{arccot}(x+1)}{2} - \frac{i}{4}\ln(x+1)\ln(1+i(x+1)) + \frac{i}{4}\ln(x+1)\ln(1-i(x+1)) - \frac{i}{4}\text{dilog}(1+i(x+1)) + \frac{i}{4}\text{dilog}($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(x+1)/(2+2*x),x)
```

```
[Out] 1/2*ln(x+1)*arccot(x+1)-1/4*I*ln(x+1)*ln(1+I*(x+1))+1/4*I*ln(x+1)*ln(1-I*(x
+1))-1/4*I*dilog(1+I*(x+1))+1/4*I*dilog(1-I*(x+1))
```

Maxima [B] time = 1.59732, size = 86, normalized size = 2.46

$$\frac{1}{4}\arctan(x+1,0)\log\left(x^2+2x+2\right)+\frac{1}{2}\operatorname{arccot}(x+1)\log(x+1)+\frac{1}{2}\arctan(x+1)\log(x+1)-\frac{1}{2}\arctan(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(1+x)/(2+2*x),x, algorithm="maxima")
```

```
[Out] 1/4*arctan2(x + 1, 0)*log(x^2 + 2*x + 2) + 1/2*arccot(x + 1)*log(x + 1) + 1
/2*arctan(x + 1)*log(x + 1) - 1/2*arctan(x + 1)*log(abs(x + 1)) + 1/4*I*dil
og(I*x + I + 1) - 1/4*I*dilog(-I*x - I + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(x+1)}{2(x+1)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(1+x)/(2+2*x),x, algorithm="fricas")
```

```
[Out] integral(1/2*arccot(x + 1)/(x + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{\int\frac{\operatorname{acot}(x+1)}{x+1}\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(1+x)/(2+2*x),x)
```

```
[Out] Integral(acot(x + 1)/(x + 1), x)/2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(x+1)}{2(x+1)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(1+x)/(2+2*x),x, algorithm="giac")
```

```
[Out] integrate(1/2*arccot(x + 1)/(x + 1), x)
```

3.127 $\int \frac{\cot^{-1}(a+bx)}{\frac{ad}{b}+dx}\,dx$

Optimal. Leaf size=45

$$\frac{i\text{PolyLog}\left(2,\frac{i}{a+bx}\right)}{2d}-\frac{i\text{PolyLog}\left(2,-\frac{i}{a+bx}\right)}{2d}$$

```
[Out] ((-I/2)*PolyLog[2, (-I)/(a + b*x)])/d + ((I/2)*PolyLog[2, I/(a + b*x)])/d
```

Rubi [A] time = 0.0456755, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {5044, 12, 4849, 2391}

$$\frac{i\text{PolyLog}\left(2,\frac{i}{a+bx}\right)}{2d}-\frac{i\text{PolyLog}\left(2,-\frac{i}{a+bx}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*x]/((a*d)/b + d*x),x]
```

```
[Out] ((-I/2)*PolyLog[2, (-I)/(a + b*x)])/d + ((I/2)*PolyLog[2, I/(a + b*x)])/d
```

Rule 5044

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((f*x)/d)^m*(a + b*ArcCot[x])^p, x],
x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[d*e - c*f, 0] &&
IGtQ[p, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\cot^{-1}(a+bx)}{\frac{ad}{b}+dx}\,dx = \frac{\text{Subst}\left(\int \frac{b\cot^{-1}(x)}{dx}\,dx, x, a+bx\right)}{b}$$
$$= \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{x}\,dx, x, a+bx\right)}{d}$$
$$= \frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x}\,dx, x, a+bx\right)}{2d} - \frac{i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x}\,dx, x, a+bx\right)}{2d}$$
$$= -\frac{i\text{Li}_2\left(-\frac{i}{a+bx}\right)}{2d} + \frac{i\text{Li}_2\left(\frac{i}{a+bx}\right)}{2d}$$

Mathematica [A] time = 0.0062224, size = 38, normalized size = 0.84

$$-\frac{i\left(\text{PolyLog}\left(2,-\frac{i}{a+bx}\right)-\text{PolyLog}\left(2,\frac{i}{a+bx}\right)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*x]/((a*d)/b + d*x),x]
```

```
[Out] ((-I/2)*(PolyLog[2, (-I)/(a + b*x)] - PolyLog[2, I/(a + b*x)]))/d
```

Maple [B] time = 0.054, size = 98, normalized size = 2.2

$$\frac{\ln(bx+a)\,\text{arccot}(bx+a)}{d} - \frac{\frac{i}{2}\ln(bx+a)\ln(1+i(bx+a))}{d} + \frac{\frac{i}{2}\ln(bx+a)\ln(1-i(bx+a))}{d} - \frac{\frac{i}{2}\text{dilog}(1+i(bx+a))}{d} +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(b*x+a)/(a*d/b+d*x),x)
```

```
[Out] 1/d*ln(b*x+a)*arccot(b*x+a)-1/2*I/d*ln(b*x+a)*ln(1+I*(b*x+a))+1/2*I/d*ln(b*
x+a)*ln(1-I*(b*x+a))-1/2*I/d*dilog(1+I*(b*x+a))+1/2*I/d*dilog(1-I*(b*x+a))
```

Maxima [B] time = 1.6455, size = 165, normalized size = 3.67

$$\frac{\operatorname{arccot}(bx+a)\log\left(dx+\frac{ad}{b}\right)}{d}+\frac{\arctan\left(\frac{b^2x+ab}{b}\right)\log\left(dx+\frac{ad}{b}\right)}{d}+\frac{\arctan(bx+a,0)\log\left(b^2x^2+2\,abx+a^2+1\right)-2\,\mathrm{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(a*d/b+d*x),x, algorithm="maxima")
```

```
[Out] arccot(b*x + a)*log(d*x + a*d/b)/d + arctan((b^2*x + a*b)/b)*log(d*x + a*d/
b)/d + 1/2*(arctan2(b*x + a, 0)*log(b^2*x^2 + 2*a*b*x + a^2 + 1) - 2*arctan
(b*x + a)*log(abs(b*x + a)) + I*dilog(I*b*x + I*a + 1) - I*dilog(-I*b*x - I
*a + 1))/d
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{b\operatorname{arccot}(bx+a)}{bdx+ad},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(a*d/b+d*x),x, algorithm="fricas")
```

```
[Out] integral(b*arccot(b*x + a)/(b*d*x + a*d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\frac{b\int\frac{\operatorname{acot}(a+bx)}{a+bx}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(b*x+a)/(a*d/b+d*x),x)
```

```
[Out] b*Integral(acot(a + b*x)/(a + b*x), x)/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(bx+a)}{dx+\frac{ad}{b}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(b*x+a)/(a*d/b+d*x),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*x + a)/(d*x + a*d/b), x)
```

3.128 $\int (a+bx)^2\sqrt{\cot^{-1}(a+bx)}\,dx$

Optimal. Leaf size=20

$$\text{Unintegrable}\left((a+bx)^2\sqrt{\cot^{-1}(a+bx)},x\right)$$

```
[Out] Unintegrable[(a + b*x)^2*Sqrt[ArcCot[a + b*x]], x]
```

Rubi [A] time = 0.0176178, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int (a+bx)^2\sqrt{\cot^{-1}(a+bx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*x)^2*Sqrt[ArcCot[a + b*x]],x]
```

```
[Out] Defer[Int][(a + b*x)^2*Sqrt[ArcCot[a + b*x]], x]
```

Rubi steps

$$\int (a+bx)^2\sqrt{\cot^{-1}(a+bx)}\,dx=\int (a+bx)^2\sqrt{\cot^{-1}(a+bx)}\,dx$$

Mathematica [A] time = 8.5454, size = 0, normalized size = 0.

$$\int (a+bx)^2\sqrt{\cot^{-1}(a+bx)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*x)^2*Sqrt[ArcCot[a + b*x]],x]
```

```
[Out] Integrate[(a + b*x)^2*Sqrt[ArcCot[a + b*x]], x]
```

Maple [A] time = 0.55, size = 0, normalized size = 0.

$$\int (bx+a)^2 \sqrt{\operatorname{arccot}(bx+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*arccot(b*x+a)^(1/2),x)
```

```
[Out] int((b*x+a)^2*arccot(b*x+a)^(1/2),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int (a+bx)^2 \sqrt{\operatorname{acot}(a+bx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*acot(b*x+a)**(1/2),x)
```

```
[Out] Integral((a + b*x)**2*sqrt(acot(a + b*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^2\sqrt{\operatorname{arccot}(bx+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^2*arccot(b*x+a)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^2*sqrt(arccot(b*x + a)), x)
```

3.129 $\int (e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right) dx$

Optimal. Leaf size=233

$$\frac{(e+fx)^4\left(a+b\cot^{-1}(c+dx)\right)}{4f}+\frac{bfx\left(-\left(1-6c^2\right)f^2-12cdef+6d^2e^2\right)}{4d^3}+\frac{b\left(-6\left(1-c^2\right)d^2e^2f^2+4c\left(3-c^2\right)def^3+\left(c^4\right.\right.}{4d}$$

```
[Out] (b*f*(6*d^2*e^2 - 12*c*d*e*f - (1 - 6*c^2)*f^2)*x)/(4*d^3) + (b*f^2*(d*e -
c*f)*(c + d*x)^2)/(2*d^4) + (b*f^3*(c + d*x)^3)/(12*d^4) + ((e + f*x)^4*(a
+ b*ArcCot[c + d*x]))/(4*f) + (b*(d^4*e^4 - 4*c*d^3*e^3*f - 6*(1 - c^2)*d^2
*e^2*f^2 + 4*c*(3 - c^2)*d*e*f^3 + (1 - 6*c^2 + c^4)*f^4)*ArcTan[c + d*x])/
(4*d^4*f) + (b*(d*e - c*f)*(d*e + f - c*f)*(d*e - (1 + c)*f)*Log[1 + (c + d
*x)^2])/(2*d^4)
```

Rubi [A] time = 0.356664, antiderivative size = 233, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5048, 4863, 702, 635, 203, 260}

$$\frac{(e+fx)^4\left(a+b\cot^{-1}(c+dx)\right)}{4f}+\frac{bfx\left(-\left(1-6c^2\right)f^2-12cdef+6d^2e^2\right)}{4d^3}+\frac{b\left(-6\left(1-c^2\right)d^2e^2f^2+4c\left(3-c^2\right)def^3+\left(c^4\right.\right.}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^3*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] (b*f*(6*d^2*e^2 - 12*c*d*e*f - (1 - 6*c^2)*f^2)*x)/(4*d^3) + (b*f^2*(d*e -
c*f)*(c + d*x)^2)/(2*d^4) + (b*f^3*(c + d*x)^3)/(12*d^4) + ((e + f*x)^4*(a
+ b*ArcCot[c + d*x]))/(4*f) + (b*(d^4*e^4 - 4*c*d^3*e^3*f - 6*(1 - c^2)*d^2
*e^2*f^2 + 4*c*(3 - c^2)*d*e*f^3 + (1 - 6*c^2 + c^4)*f^4)*ArcTan[c + d*x])/
(4*d^4*f) + (b*(d*e - c*f)*(d*e + f - c*f)*(d*e - (1 + c)*f)*Log[1 + (c + d
*x)^2])/(2*d^4)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 702

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Polyno
mialDivide[(d + e*x)^m, a + c*x^2, x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[
c*d^2 + a*e^2, 0] && IGtQ[m, 1] && (NeQ[d, 0] || GtQ[m, 2])
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int (e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right) dx = \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)^3 \left(a+b\cot^{-1}(x)\right) dx, x, c+dx\right)}{d}$$

$$= \frac{(e+fx)^4 \left(a+b\cot^{-1}(c+dx)\right)}{4f} + \frac{b\,\text{Subst}\left(\int \frac{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^4}{1+x^2} dx, x, c+dx\right)}{4f}$$

$$= \frac{(e+fx)^4 \left(a+b\cot^{-1}(c+dx)\right)}{4f} + \frac{b\,\text{Subst}\left(\int \left(\frac{f^2\left(6d^2e^2-12cdef-\left(1-6c^2\right)f^2\right)}{d^4} + \frac{4f^3(de-cf)}{d^4}\right.\right.}{}$$

$$= \frac{bf\left(6d^2e^2-12cdef-\left(1-6c^2\right)f^2\right)x}{4d^3} + \frac{bf^2(de-cf)(c+dx)^2}{2d^4} + \frac{bf^3(c+dx)^3}{12d^4} + \cdots$$

$$= \frac{bf\left(6d^2e^2-12cdef-\left(1-6c^2\right)f^2\right)x}{4d^3} + \frac{bf^2(de-cf)(c+dx)^2}{2d^4} + \frac{bf^3(c+dx)^3}{12d^4} + \cdots$$

$$= \frac{bf\left(6d^2e^2-12cdef-\left(1-6c^2\right)f^2\right)x}{4d^3} + \frac{bf^2(de-cf)(c+dx)^2}{2d^4} + \frac{bf^3(c+dx)^3}{12d^4} + \cdots$$

Mathematica [C] time = 0.266223, size = 157, normalized size = 0.67

$$\frac{(e+fx)^4 \left(a+b\cot^{-1}(c+dx)\right) + \frac{b\left(6dfx^2x\left(\left(6c^2-1\right)f^2-12cdef+6d^2e^2\right)+12f^3(c+dx)^2(de-cf)-3i(de-(c-i)f)^4\log(-c-dx+i)+3i(de-(c+i)f)^4\log(c+dx+i\cdots\right.}{6d^4}}{4f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^3*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] ((e + f*x)^4*(a + b*ArcCot[c + d*x]) + (b*(6*d*f^2*(6*d^2*e^2 - 12*c*d*e*f
+ (-1 + 6*c^2)*f^2)*x + 12*f^3*(d*e - c*f)*(c + d*x)^2 + 2*f^4*(c + d*x)^3
- (3*I)*(d*e - (-I + c)*f)^4*Log[I - c - d*x] + (3*I)*(d*e - (I + c)*f)^4*L
og[I + c + d*x]))/(6*d^4))/(4*f)
```

Maple [B] time = 0.052, size = 526, normalized size = 2.3

$$\frac{bf^3\ln\left(1+(dx+c)^2\right)c}{2d^4} - \frac{3bf\arctan(dx+c)e^2}{2d^2} - \frac{3bf^3\arctan(dx+c)c^2}{2d^4} - \frac{b\arctan(dx+c)ce^3}{d} + \frac{3bf\,\text{arccot}(dx+\cdots}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^3*(a+b*arccot(d*x+c)),x)
```

```
[Out] 1/2/d^4*b*f^3*ln(1+(d*x+c)^2)*c-3/2/d^2*b*f*arctan(d*x+c)*e^2-3/2/d^4*b*f^3
*arctan(d*x+c)*c^2-1/d*b*arctan(d*x+c)*c*e^3+3/2*b*f*arccot(d*x+c)*e^2*x^2+
3/4*b/d^3*f^3*c^2*x+3/2*b/d*f*e^2*x-1/4/d^2*b*f^3*c*x^2+1/2/d*b*f^2*e*x^2-1
/2/d^4*b*f^3*ln(1+(d*x+c)^2)*c^3+1/4/d^4*b*f^3*arctan(d*x+c)*c^4-1/2/d^3*b*
f^2*ln(1+(d*x+c)^2)*e+b*f^2*arccot(d*x+c)*e*x^3+3/2/d^2*b*f*c*e^2-5/2/d^3*b
*f^2*c^2*e+a*x*e^3+1/4*a*f^3*x^4+13/12/d^4*b*f^3*c^3+1/4*a/f*e^4-1/4/d^4*b*
f^3*c-1/4*b/d^3*f^3*x+a*f^2*x^3*e+3/2*a*f*x^2*e^2+1/12/d*b*f^3*x^3+1/4*b/f*
arccot(d*x+c)*e^4+1/4*b*f^3*arccot(d*x+c)*x^4+1/4*b/f*arctan(d*x+c)*e^4+arc
cot(d*x+c)*x*b*e^3+1/2/d*b*ln(1+(d*x+c)^2)*e^3+1/4/d^4*b*f^3*arctan(d*x+c)+
3/d^3*b*f^2*arctan(d*x+c)*c*e+3/2/d^3*b*f^2*ln(1+(d*x+c)^2)*c^2*e-3/2/d^2*b
*f*ln(1+(d*x+c)^2)*c*e^2+3/2/d^2*b*f*arctan(d*x+c)*c^2*e^2-1/d^3*b*f^2*arct
an(d*x+c)*c^3*e-2*b/d^2*f^2*c*e*x
```

Maxima [A] time = 1.49634, size = 460, normalized size = 1.97

$$\frac{1}{4}af^3x^4 + aef^2x^3 + \frac{3}{2}ae^2fx^2 + \frac{3}{2}\left(x^2\operatorname{arccot}(dx+c) + d\left(\frac{x}{d^2} + \frac{(c^2-1)\arctan\left(\frac{d^2x+cd}{d}\right)}{d^3} - \frac{c\log\left(d^2x^2+2cdx+c^2+1\right)}{d^3}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*(a+b*arccot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*a*f^3*x^4 + a*e*f^2*x^3 + 3/2*a*e^2*f*x^2 + 3/2*(x^2*arccot(d*x + c) +
d*(x/d^2 + (c^2 - 1)*arctan((d^2*x + c*d)/d)/d^3 - c*log(d^2*x^2 + 2*c*d*x
+ c^2 + 1)/d^3))*b*e^2*f + 1/2*(2*x^3*arccot(d*x + c) + d*((d*x^2 - 4*c*x)/
d^3 - 2*(c^3 - 3*c)*arctan((d^2*x + c*d)/d)/d^4 + (3*c^2 - 1)*log(d^2*x^2 +
 2*c*d*x + c^2 + 1)/d^4))*b*e*f^2 + 1/12*(3*x^4*arccot(d*x + c) + d*((d^2*x
^3 - 3*c*d*x^2 + 3*(3*c^2 - 1)*x)/d^4 + 3*(c^4 - 6*c^2 + 1)*arctan((d^2*x +
 c*d)/d)/d^5 - 6*(c^3 - c)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^5))*b*f^3 + a
*e^3*x + 1/2*(2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*b*e^3/d
```

Fricas [A] time = 2.46891, size = 694, normalized size = 2.98

$$\frac{3ad^4f^3x^4 + \left(12ad^4ef^2 + bd^3f^3\right)x^3 + 3\left(6ad^4e^2f + 2bd^3ef^2 - bcd^2f^3\right)x^2 + 3\left(4ad^4e^3 + 6bd^3e^2f - 8bcd^2ef^2 + \left(3bc^2 -\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*(a+b*arccot(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*d^4*f^3*x^4 + (12*a*d^4*e*f^2 + b*d^3*f^3)*x^3 + 3*(6*a*d^4*e^2*f
 + 2*b*d^3*e*f^2 - b*c*d^2*f^3)*x^2 + 3*(4*a*d^4*e^3 + 6*b*d^3*e^2*f - 8*b*
c*d^2*e*f^2 + (3*b*c^2 - b)*d*f^3)*x + 3*(b*d^4*f^3*x^4 + 4*b*d^4*e*f^2*x^3
 + 6*b*d^4*e^2*f*x^2 + 4*b*d^4*e^3*x)*arccot(d*x + c) - 3*(4*b*c*d^3*e^3 -
6*(b*c^2 - b)*d^2*e^2*f + 4*(b*c^3 - 3*b*c)*d*e*f^2 - (b*c^4 - 6*b*c^2 + b)
*f^3)*arctan(d*x + c) + 6*(b*d^3*e^3 - 3*b*c*d^2*e^2*f + (3*b*c^2 - b)*d*e*
f^2 - (b*c^3 - b*c)*f^3)*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/d^4
```

Sympy [A] time = 8.92132, size = 627, normalized size = 2.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**3*(a+b*acot(d*x+c)),x)
```

```
[Out] Piecewise((a*e**3*x + 3*a*e**2*f*x**2/2 + a*e*f**2*x**3 + a*f**3*x**4/4 - b
*c**4*f**3*acot(c + d*x)/(4*d**4) + b*c**3*e*f**2*acot(c + d*x)/d**3 - b*c*
*3*f**3*log(c**2/d**2 + 2*c*x/d + x**2 + d**(-2))/(2*d**4) - 3*b*c**2*e**2*
f*acot(c + d*x)/(2*d**2) + 3*b*c**2*e*f**2*log(c**2/d**2 + 2*c*x/d + x**2 +
 d**(-2))/(2*d**3) + 3*b*c**2*f**3*x/(4*d**3) + 3*b*c**2*f**3*acot(c + d*x)
/(2*d**4) + b*c*e**3*acot(c + d*x)/d - 3*b*c*e**2*f*log(c**2/d**2 + 2*c*x/d
 + x**2 + d**(-2))/(2*d**2) - 2*b*c*e*f**2*x/d**2 - b*c*f**3*x**2/(4*d**2)
- 3*b*c*e*f**2*acot(c + d*x)/d**3 + b*c*f**3*log(c**2/d**2 + 2*c*x/d + x**2
 + d**(-2))/(2*d**4) + b*e**3*x*acot(c + d*x) + 3*b*e**2*f*x**2*acot(c + d*
x)/2 + b*e*f**2*x**3*acot(c + d*x) + b*f**3*x**4*acot(c + d*x)/4 + b*e**3*l
og(c**2/d**2 + 2*c*x/d + x**2 + d**(-2))/(2*d) + 3*b*e**2*f*x/(2*d) + b*e*f
**2*x**2/(2*d) + b*f**3*x**3/(12*d) + 3*b*e**2*f*acot(c + d*x)/(2*d**2) - b
*e*f**2*log(c**2/d**2 + 2*c*x/d + x**2 + d**(-2))/(2*d**3) - b*f**3*x/(4*d*
*3) - b*f**3*acot(c + d*x)/(4*d**4), Ne(d, 0)), ((a + b*acot(c))*(e**3*x +
3*e**2*f*x**2/2 + e*f**2*x**3 + f**3*x**4/4), True))
```

Giac [B] time = 3.22393, size = 1045, normalized size = 4.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*(a+b*arccot(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/24*(6*pi*b*d^4*f^3*x^4*floor(1/2*(pi*sgn(d*x + c) - 2*arctan(1/(d*x + c))
)/pi) - 3*pi*b*d^4*f^3*x^4*sgn(d*x + c) + 3*pi*b*d^4*f^3*x^4 + 6*b*d^4*f^3*
x^4*arctan(1/(d*x + c)) + 6*a*d^4*f^3*x^4 + 24*b*d^4*f^2*x^3*arctan(1/(d*x
+ c))*e + 24*a*d^4*f^2*x^3*e + 2*b*d^3*f^3*x^3 + 36*b*d^4*f*x^2*arctan(1/(d
*x + c))*e^2 + 3*pi*b*c^4*f^3*sgn(d*x + c) - 12*pi*b*c^3*d*f^2*e*sgn(d*x +
c) - 3*pi*b*c^4*f^3 - 6*b*c*d^2*f^3*x^2 - 6*b*c^4*f^3*arctan(1/(d*x + c)) +
 36*a*d^4*f*x^2*e^2 + 12*pi*b*c^3*d*f^2*e + 12*b*d^3*f^2*x^2*e + 24*b*c^3*d
*f^2*arctan(1/(d*x + c))*e + 18*pi*b*c^2*d^2*f*e^2*sgn(d*x + c) + 18*b*c^2*
d*f^3*x + 24*b*d^4*x*arctan(1/(d*x + c))*e^3 - 18*pi*b*c^2*d^2*f*e^2 - 36*b
*c^2*d^2*f*arctan(1/(d*x + c))*e^2 - 48*b*c*d^2*f^2*x*e - 12*b*c^3*f^3*log(
d^2*x^2 + 2*c*d*x + c^2 + 1) + 36*b*c^2*d*f^2*e*log(d^2*x^2 + 2*c*d*x + c^2
 + 1) - 18*pi*b*c^2*f^3*sgn(d*x + c) + 36*pi*b*c*d*f^2*e*sgn(d*x + c) + 18*
pi*b*c^2*f^3 + 36*b*c^2*f^3*arctan(1/(d*x + c)) + 24*a*d^4*x*e^3 - 24*b*c*d
^3*arctan(d*x + c)*e^3 + 36*b*d^3*f*x*e^2 - 36*pi*b*c*d*f^2*e - 72*b*c*d*f^
2*arctan(1/(d*x + c))*e - 36*b*c*d^2*f*e^2*log(d^2*x^2 + 2*c*d*x + c^2 + 1)
 - 18*pi*b*d^2*f*e^2*sgn(d*x + c) - 6*b*d*f^3*x + 18*pi*b*d^2*f*e^2 + 36*b*
d^2*f*arctan(1/(d*x + c))*e^2 + 12*b*c*f^3*log(d^2*x^2 + 2*c*d*x + c^2 + 1)
 + 12*b*d^3*e^3*log(d^2*x^2 + 2*c*d*x + c^2 + 1) - 12*b*d*f^2*e*log(d^2*x^2
 + 2*c*d*x + c^2 + 1) + 3*pi*b*f^3*sgn(d*x + c) - 3*pi*b*f^3 - 6*b*f^3*arct
an(1/(d*x + c)))/d^4
```

3.130 $\int (e+fx)^2 \left(a+b\cot^{-1}(c+dx)\right)\,dx$

Optimal. Leaf size=154

$$\frac{(e+fx)^3\left(a+b\cot^{-1}(c+dx)\right)}{3f}+\frac{b\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\log\left((c+dx)^2+1\right)}{6d^3}+\frac{b(de-cf)\left(-\left(3-c^2\right)f^2-2cd\right.}{3d^3f}$$

```
[Out] (b*f*(d*e - c*f)*x)/d^2 + (b*f^2*(c + d*x)^2)/(6*d^3) + ((e + f*x)^3*(a + b
*ArcCot[c + d*x]))/(3*f) + (b*(d*e - c*f)*(d^2*e^2 - 2*c*d*e*f - (3 - c^2)*
f^2)*ArcTan[c + d*x])/(3*d^3*f) + (b*(3*d^2*e^2 - 6*c*d*e*f - (1 - 3*c^2)*f
^2)*Log[1 + (c + d*x)^2])/(6*d^3)
```

Rubi [A] time = 0.185669, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5048, 4863, 702, 635, 203, 260}

$$\frac{(e+fx)^3\left(a+b\cot^{-1}(c+dx)\right)}{3f}+\frac{b\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\log\left((c+dx)^2+1\right)}{6d^3}+\frac{b(de-cf)\left(-\left(3-c^2\right)f^2-2cd\right.}{3d^3f}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^2*(a + b*ArcCot[c + d*x]),x]
```


```
[Out] (b*f*(d*e - c*f)*x)/d^2 + (b*f^2*(c + d*x)^2)/(6*d^3) + ((e + f*x)^3*(a + b
*ArcCot[c + d*x]))/(3*f) + (b*(d*e - c*f)*(d^2*e^2 - 2*c*d*e*f - (3 - c^2)*
f^2)*ArcTan[c + d*x])/(3*d^3*f) + (b*(3*d^2*e^2 - 6*c*d*e*f - (1 - 3*c^2)*f
^2)*Log[1 + (c + d*x)^2])/(6*d^3)
```


Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 702

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Polyno
mialDivide[(d + e*x)^m, a + c*x^2, x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[
c*d^2 + a*e^2, 0] && IGtQ[m, 1] && (NeQ[d, 0] || GtQ[m, 2])
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int (e+fx)^2 \left(a+b\cot^{-1}(c+dx)\right) dx = \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)^2 \left(a+b\cot^{-1}(x)\right) dx, x, c+dx\right)}{d}$$

$$= \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)}{3f} + \frac{b\,\text{Subst}\left(\int \frac{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^3}{1+x^2} dx, x, c+dx\right)}{3f}$$

$$= \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)}{3f} + \frac{b\,\text{Subst}\left(\int \left(\frac{3f^2(de-cf)}{d^3}+\frac{f^3x}{d^3}+\frac{(de-cf)\left(d^2e^2-2cdef-\right.}{}\right.\right.}{3}$$

$$= \frac{bf(de-cf)x}{d^2} + \frac{bf^2(c+dx)^2}{6d^3} + \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)}{3f} + \frac{b\,\text{Subst}\left(\int \frac{(de-}{}\right.}{}$$

$$= \frac{bf(de-cf)x}{d^2} + \frac{bf^2(c+dx)^2}{6d^3} + \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)}{3f} + \frac{\left(b\left(3d^2e^2-6cd\right.\right.}{}$$

$$= \frac{bf(de-cf)x}{d^2} + \frac{bf^2(c+dx)^2}{6d^3} + \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)}{3f} + \frac{b(de-cf)\left(d^2e^2\right.}{}$$

Mathematica [C] time = 0.145346, size = 118, normalized size = 0.77

$$\frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right) + \frac{b\left(6df^2x(de-cf)-i(de-(c-i)f)^3\log(-c-dx+i)+i(de-(c+i)f)^3\log(c+dx+i)+f^3(c+dx)^2\right)}{2d^3}}{3f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^2*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] ((e + f*x)^3*(a + b*ArcCot[c + d*x]) + (b*(6*d*f^2*(d*e - c*f)*x + f^3*(c +
 d*x)^2 - I*(d*e - (-I + c)*f)^3*Log[I - c - d*x] + I*(d*e - (I + c)*f)^3*L
og[I + c + d*x]))/(2*d^3))/(3*f)
```

Maple [B] time = 0.048, size = 312, normalized size = 2.

$$\frac{bf\arctan(dx+c)\,c^2e}{d^2} - \frac{bf\ln\left(1+(dx+c)^2\right)ce}{d^2} - \frac{b\arctan(dx+c)\,ce^2}{d} - \frac{bf^2\ln\left(1+(dx+c)^2\right)}{6\,d^3} - \frac{5\,bf^2c^2}{6\,d^3} + \text{arccot}\,(dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^2*(a+b*arccot(d*x+c)),x)
```

```
[Out] 1/d^2*b*f*arctan(d*x+c)*c^2*e-1/d^2*b*f*ln(1+(d*x+c)^2)*c*e-1/d*b*arctan(d*
x+c)*c*e^2-1/6/d^3*b*f^2*ln(1+(d*x+c)^2)-5/6/d^3*b*f^2*c^2+arccot(d*x+c)*x*
b*e^2+1/3*b*f^2*arccot(d*x+c)*x^3-1/d^2*b*f*arctan(d*x+c)*e+1/d^3*b*f^2*arc
tan(d*x+c)*c+1/2/d*b*ln(1+(d*x+c)^2)*e^2-1/3/d^3*b*f^2*arctan(d*x+c)*c^3+1/
3*b/f*arctan(d*x+c)*e^3+1/2/d^3*b*f^2*ln(1+(d*x+c)^2)*c^2+b/d*f*e*x-2/3*b/d
^2*f^2*c*x+1/3*b/f*arccot(d*x+c)*e^3+a*f*x^2*e+a*x*e^2+1/d^2*b*f*c*e+1/6/d*
b*f^2*x^2+1/3*a*f^2*x^3+1/3*a/f*e^3+b*f*arccot(d*x+c)*e*x^2
```

Maxima [A] time = 1.49671, size = 292, normalized size = 1.9

$$\frac{1}{3}af^2x^3 + aefx^2 + \left(x^2\operatorname{arccot}(dx+c) + d\left(\frac{x}{d^2} + \frac{(c^2-1)\arctan\left(\frac{d^2x+cd}{d}\right)}{d^3} - \frac{c\log\left(d^2x^2+2cdx+c^2+1\right)}{d^3}\right)\right)bef + \frac{1}{6}\left(2x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/3*a*f^2*x^3 + a*e*f*x^2 + (x^2*arccot(d*x + c) + d*(x/d^2 + (c^2 - 1)*arc
tan((d^2*x + c*d)/d)/d^3 - c*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^3))*b*e*f +
 1/6*(2*x^3*arccot(d*x + c) + d*((d*x^2 - 4*c*x)/d^3 - 2*(c^3 - 3*c)*arctan
((d^2*x + c*d)/d)/d^4 + (3*c^2 - 1)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^4))*
b*f^2 + a*e^2*x + 1/2*(2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*
b*e^2/d
```

Fricas [A] time = 2.38821, size = 459, normalized size = 2.98

$$\frac{2ad^3f^2x^3 + \left(6ad^3ef + bd^2f^2\right)x^2 + 2\left(3ad^3e^2 + 3bd^2ef - 2bcdf^2\right)x + 2\left(bd^3f^2x^3 + 3bd^3efx^2 + 3bd^3e^2x\right)\operatorname{arccot}(dx+\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*d^3*f^2*x^3 + (6*a*d^3*e*f + b*d^2*f^2)*x^2 + 2*(3*a*d^3*e^2 + 3*b
*d^2*e*f - 2*b*c*d*f^2)*x + 2*(b*d^3*f^2*x^3 + 3*b*d^3*e*f*x^2 + 3*b*d^3*e^
2*x)*arccot(d*x + c) - 2*(3*b*c*d^2*e^2 - 3*(b*c^2 - b)*d*e*f + (b*c^3 - 3*
```

```
b*c)*f^2)*arctan(d*x + c) + (3*b*d^2*e^2 - 6*b*c*d*e*f + (3*b*c^2 - b)*f^2)
*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/d^3
```

Sympy [A] time = 4.35104, size = 357, normalized size = 2.32

$$\begin{cases} ae^2x + aefx^2 + \frac{af^2x^3}{3} + \frac{bc^3f^2\operatorname{acot}(c+dx)}{3d^3} - \frac{bc^2ef\operatorname{acot}(c+dx)}{d^2} + \frac{bc^2f^2\log\left(\frac{c^2}{d^2}+\frac{2cx}{d}+x^2+\frac{1}{d^2}\right)}{2d^3} + \frac{bce^2\operatorname{acot}(c+dx)}{d} - \frac{bcef\log\left(\frac{c^2}{d^2}+\frac{2cx}{d}+x^2+\frac{1}{d^2}\right)}{d^2} - \\ (a + b\operatorname{acot}(c))\left(e^2x + efx^2 + \frac{f^2x^3}{3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*(a+b*acot(d*x+c)),x)
```

```
[Out] Piecewise((a*e**2*x + a*e*f*x**2 + a*f**2*x**3/3 + b*c**3*f**2*acot(c + d*x
)/(3*d**3) - b*c**2*e*f*acot(c + d*x)/d**2 + b*c**2*f**2*log(c**2/d**2 + 2*
c*x/d + x**2 + d**(-2))/(2*d**3) + b*c*e**2*acot(c + d*x)/d - b*c*e*f*log(c
**2/d**2 + 2*c*x/d + x**2 + d**(-2))/d**2 - 2*b*c*f**2*x/(3*d**2) - b*c*f**
2*acot(c + d*x)/d**3 + b*e**2*x*acot(c + d*x) + b*e*f*x**2*acot(c + d*x) +
b*f**2*x**3*acot(c + d*x)/3 + b*e**2*log(c**2/d**2 + 2*c*x/d + x**2 + d**(-
2))/(2*d) + b*e*f*x/d + b*f**2*x**2/(6*d) + b*e*f*acot(c + d*x)/d**2 - b*f*
*2*log(c**2/d**2 + 2*c*x/d + x**2 + d**(-2))/(6*d**3), Ne(d, 0)), ((a + b*a
cot(c))*(e**2*x + e*f*x**2 + f**2*x**3/3), True))
```

Giac [B] time = 1.4938, size = 641, normalized size = 4.16

$$\frac{2\pi bd^3f^2x^3\left\lfloor\frac{\pi\operatorname{sgn}(dx+c)-2\arctan\left(\frac{1}{dx+c}\right)}{2\pi}\right\rfloor - \pi bd^3f^2x^3\operatorname{sgn}(dx+c) + \pi bd^3f^2x^3 + 2bd^3f^2x^3\arctan\left(\frac{1}{dx+c}\right) + 2ad^3f^2x^3 + 6bd^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/6*(2*pi*b*d^3*f^2*x^3*floor(1/2*(pi*sgn(d*x + c) - 2*arctan(1/(d*x + c)))
/pi) - pi*b*d^3*f^2*x^3*sgn(d*x + c) + pi*b*d^3*f^2*x^3 + 2*b*d^3*f^2*x^3*a
rctan(1/(d*x + c)) + 2*a*d^3*f^2*x^3 + 6*b*d^3*f*x^2*arctan(1/(d*x + c))*e
+ 6*a*d^3*f*x^2*e - pi*b*c^3*f^2*sgn(d*x + c) + 3*pi*b*c^2*d*f*e*sgn(d*x +
c) + pi*b*c^3*f^2 + b*d^2*f^2*x^2 + 2*b*c^3*f^2*arctan(1/(d*x + c)) + 6*b*d
^3*x*arctan(1/(d*x + c))*e^2 - 3*pi*b*c^2*d*f*e - 6*b*c^2*d*f*arctan(1/(d*x
```

```
 + c))*e - 4*b*c*d*f^2*x + 6*a*d^3*x*e^2 - 6*b*c*d^2*arctan(d*x + c)*e^2 +
6*b*d^2*f*x*e + 3*b*c^2*f^2*log(d^2*x^2 + 2*c*d*x + c^2 + 1) - 6*b*c*d*f*e*
log(d^2*x^2 + 2*c*d*x + c^2 + 1) + 3*pi*b*c*f^2*sgn(d*x + c) - 3*pi*b*d*f*e
*sgn(d*x + c) - 3*pi*b*c*f^2 - 6*b*c*f^2*arctan(1/(d*x + c)) + 3*pi*b*d*f*e
 + 6*b*d*f*arctan(1/(d*x + c))*e + 3*b*d^2*e^2*log(d^2*x^2 + 2*c*d*x + c^2
+ 1) - b*f^2*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/d^3
```

3.131 $\int (e+fx)\left(a+b\cot^{-1}(c+dx)\right)\,dx$

Optimal. Leaf size=97

$$\frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{b(de-cf)\log\left((c+dx)^2+1\right)}{2d^2}+\frac{b(-cf+de+f)(de-(c+1)f)\tan^{-1}(c+dx)}{2d^2f}+\frac{bfx}{2d}$$

```
[Out] (b*f*x)/(2*d) + ((e + f*x)^2*(a + b*ArcCot[c + d*x]))/(2*f) + (b*(d*e + f -
 c*f)*(d*e - (1 + c)*f)*ArcTan[c + d*x])/(2*d^2*f) + (b*(d*e - c*f)*Log[1 +
 (c + d*x)^2])/(2*d^2)
```

Rubi [A] time = 0.114413, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {5048, 4863, 702, 635, 203, 260}

$$\frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{b(de-cf)\log\left((c+dx)^2+1\right)}{2d^2}+\frac{b(-cf+de+f)(de-(c+1)f)\tan^{-1}(c+dx)}{2d^2f}+\frac{bfx}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] (b*f*x)/(2*d) + ((e + f*x)^2*(a + b*ArcCot[c + d*x]))/(2*f) + (b*(d*e + f -
 c*f)*(d*e - (1 + c)*f)*ArcTan[c + d*x])/(2*d^2*f) + (b*(d*e - c*f)*Log[1 +
 (c + d*x)^2])/(2*d^2)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 702

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Polyno
mialDivide[(d + e*x)^m, a + c*x^2, x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[
c*d^2 + a*e^2, 0] && IGtQ[m, 1] && (NeQ[d, 0] || GtQ[m, 2])
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$
\begin{aligned}
\int (e+fx)\left(a+b\cot^{-1}(c+dx)\right)dx &= \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)\left(a+b\cot^{-1}(x)\right)dx,x,c+dx\right)}{d}\\
&= \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{b\,\text{Subst}\left(\int \frac{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^2}{1+x^2}dx,x,c+dx\right)}{2f}\\
&= \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{b\,\text{Subst}\left(\int \left(\frac{f^2}{d^2}+\frac{(de-f-cf)(de+f-cf)+2f(de-cf)x}{d^2(1+x^2)}\right)
\end{aligned}
$$

$$
\begin{aligned}
&= \frac{bfx}{2d}+\frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{b\,\text{Subst}\left(\int \frac{(de-f-cf)(de+f-cf)+2f(de-cf)x}{1+x^2}d\right.}{2d^2f}\\
&= \frac{bfx}{2d}+\frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{(b(de-cf))\,\text{Subst}\left(\int \frac{x}{1+x^2}dx,x,c+dx\right)}{d^2}\\
&= \frac{bfx}{2d}+\frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)}{2f}+\frac{b(de+f-cf)(de-(1+c)f)\tan^{-1}(c+}{2d^2f}
\end{aligned}
$$

Mathematica [C] time = 0.0817701, size = 163, normalized size = 1.68

$$aex+\frac{1}{2}afx^2+\frac{be\left(\log\left(c^2+2cdx+d^2x^2+1\right)-2c\tan^{-1}(c+dx)\right)}{2d}+\frac{bf\left(\frac{1}{2}d\left(\frac{c+dx}{d}-\frac{c}{d}\right)^2\cot^{-1}(c+dx)+\frac{1}{2}d\left(-\frac{i(-c+i)^2\log(-}{2d^2}\right.\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] a*e*x + (a*f*x^2)/2 + b*e*x*ArcCot[c + d*x] + (b*f*((d*(-(c/d) + (c + d*x)/
d)^2*ArcCot[c + d*x])/2 + (d*(x/d - ((I/2)*(I - c)^2*Log[I - c - d*x])/d^2
+ ((I/2)*(I + c)^2*Log[I + c + d*x])/d^2))/2))/d + (b*e*(-2*c*ArcTan[c + d*
x] + Log[1 + c^2 + 2*c*d*x + d^2*x^2]))/(2*d)
```

Maple [A] time = 0.045, size = 146, normalized size = 1.5

$$\frac{ax^2f}{2}-\frac{ac^2f}{2d^2}+axe+\frac{ace}{d}+\frac{b\mathrm{arccot}(dx+c)fx^2}{2}-\frac{\mathrm{arccot}(dx+c)bc^2f}{2d^2}+\mathrm{arccot}(dx+c)xbe+\frac{b\mathrm{arccot}(dx+c)ce}{d}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*(a+b*arccot(d*x+c)),x)
```

```
[Out] 1/2*a*x^2*f-1/2/d^2*a*f*c^2+a*x*e+1/d*a*c*e+1/2*b*arccot(d*x+c)*f*x^2-1/2/d
^2*b*arccot(d*x+c)*f*c^2+arccot(d*x+c)*x*b*e+1/d*arccot(d*x+c)*b*c*e+1/2*b*
f*x/d+1/2/d^2*b*c*f-1/2/d^2*b*ln(1+(d*x+c)^2)*c*f+1/2/d*b*ln(1+(d*x+c)^2)*e
-1/2/d^2*b*f*arctan(d*x+c)
```

Maxima [A] time = 1.47205, size = 153, normalized size = 1.58

$$\frac{1}{2}afx^2+\frac{1}{2}\left(x^2\mathrm{arccot}(dx+c)+d\left(\frac{x}{d^2}+\frac{\left(c^2-1\right)\arctan\left(\frac{d^2x+cd}{d}\right)}{d^3}-\frac{c\log\left(d^2x^2+2cdx+c^2+1\right)}{d^3}\right)\right)bf+aex+\frac{\left(2(dx+c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*a*f*x^2 + 1/2*(x^2*arccot(d*x + c) + d*(x/d^2 + (c^2 - 1)*arctan((d^2*x
 + c*d)/d)/d^3 - c*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^3))*b*f + a*e*x + 1/2
*(2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*b*e/d
```

Fricas [A] time = 2.30109, size = 257, normalized size = 2.65

$$\frac{ad^2fx^2 + \left(2\,ad^2e + bdf\right)x + \left(bd^2fx^2 + 2\,bd^2ex\right)\operatorname{arccot}\left(dx + c\right) - \left(2\,bcde - \left(bc^2 - b\right)f\right)\arctan\left(dx + c\right) + \left(bde - bcf\right)\operatorname{lo}}{2\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(a*d^2*f*x^2 + (2*a*d^2*e + b*d*f)*x + (b*d^2*f*x^2 + 2*b*d^2*e*x)*arcc
ot(d*x + c) - (2*b*c*d*e - (b*c^2 - b)*f)*arctan(d*x + c) + (b*d*e - b*c*f)
*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/d^2
```

Sympy [A] time = 2.02614, size = 177, normalized size = 1.82

$$\begin{cases} aex + \frac{afx^2}{2} - \frac{bc^2f\operatorname{acot}(c+dx)}{2d^2} + \frac{bce\operatorname{acot}(c+dx)}{d} - \frac{bcf\log\left(\frac{c^2}{d^2}+\frac{2cx}{d}+x^2+\frac{1}{d^2}\right)}{2d^2} + bex\operatorname{acot}(c+dx) + \frac{bfx^2\operatorname{acot}(c+dx)}{2} + \frac{be\log\left(\frac{c^2}{d^2}+\frac{2cx}{d}+x^2+\right.}{2d} \\ (a + b\operatorname{acot}(c))\left(ex + \frac{fx^2}{2}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*acot(d*x+c)),x)
```

```
[Out] Piecewise((a*e*x + a*f*x**2/2 - b*c**2*f*acot(c + d*x)/(2*d**2) + b*c*e*aco
t(c + d*x)/d - b*c*f*log(c**2/d**2 + 2*c*x/d + x**2 + d**(-2))/(2*d**2) + b
*e*x*acot(c + d*x) + b*f*x**2*acot(c + d*x)/2 + b*e*log(c**2/d**2 + 2*c*x/d
 + x**2 + d**(-2))/(2*d) + b*f*x/(2*d) + b*f*acot(c + d*x)/(2*d**2), Ne(d,
0)), ((a + b*acot(c))*(e*x + f*x**2/2), True))
```

Giac [B] time = 1.23385, size = 340, normalized size = 3.51

$$\frac{2\,\pi bd^2fx^2\left\lfloor\frac{\pi\operatorname{sgn}(dx+c)-2\,\arctan\left(\frac{1}{dx+c}\right)}{2\,\pi}\right\rfloor - \pi bd^2fx^2\operatorname{sgn}\left(dx + c\right) + \pi bd^2fx^2 + 2\,bd^2fx^2\arctan\left(\frac{1}{dx+c}\right) + 2\,ad^2fx^2 + 4\,bd^2x\,\mathrm{a}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/4*(2*pi*b*d^2*f*x^2*floor(1/2*(pi*sgn(d*x + c) - 2*arctan(1/(d*x + c)))/p
i) - pi*b*d^2*f*x^2*sgn(d*x + c) + pi*b*d^2*f*x^2 + 2*b*d^2*f*x^2*arctan(1/
(d*x + c)) + 2*a*d^2*f*x^2 + 4*b*d^2*x*arctan(1/(d*x + c))*e + pi*b*c^2*f*s
gn(d*x + c) - pi*b*c^2*f - 2*b*c^2*f*arctan(1/(d*x + c)) + 4*a*d^2*x*e - 4*
b*c*d*arctan(d*x + c)*e + 2*b*d*f*x - 2*b*c*f*log(d^2*x^2 + 2*c*d*x + c^2 +
 1) + 2*b*d*e*log(d^2*x^2 + 2*c*d*x + c^2 + 1) - pi*b*f*sgn(d*x + c) + pi*b
*f + 2*b*f*arctan(1/(d*x + c)))/d^2
```

3.132 $\int \left(a+b\cot^{-1}(c+dx)\right)\,dx$

Optimal. Leaf size=38

$$ax+\frac{b\log\left((c+dx)^2+1\right)}{2d}+\frac{b(c+dx)\cot^{-1}(c+dx)}{d}$$

```
[Out] a*x + (b*(c + d*x)*ArcCot[c + d*x])/d + (b*Log[1 + (c + d*x)^2])/(2*d)
```

Rubi [A] time = 0.0201107, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5040, 4847, 260}

$$ax+\frac{b\log\left((c+dx)^2+1\right)}{2d}+\frac{b(c+dx)\cot^{-1}(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[a + b*ArcCot[c + d*x],x]
```

```
[Out] a*x + (b*(c + d*x)*ArcCot[c + d*x])/d + (b*Log[1 + (c + d*x)^2])/(2*d)
```

Rule 5040

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d},
x] && IGtQ[p, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int \left(a+b\cot^{-1}(c+dx)\right)\,dx &= ax+b\int \cot^{-1}(c+dx)\,dx\\ &= ax+\frac{b\,\mathrm{Subst}\left(\int \cot^{-1}(x)\,dx,x,c+dx\right)}{d}\\ &= ax+\frac{b(c+dx)\cot^{-1}(c+dx)}{d}+\frac{b\,\mathrm{Subst}\left(\int \frac{x}{1+x^2}\,dx,x,c+dx\right)}{d}\\ &= ax+\frac{b(c+dx)\cot^{-1}(c+dx)}{d}+\frac{b\log\left(1+(c+dx)^2\right)}{2d}\end{aligned}$$

Mathematica [A] time = 0.0120605, size = 49, normalized size = 1.29

$$ax+\frac{b\left(\log\left(c^2+2cdx+d^2x^2+1\right)-2c\tan^{-1}(c+dx)\right)}{2d}+bx\cot^{-1}(c+dx)$$

Antiderivative was successfully verified.

```
[In] Integrate[a + b*ArcCot[c + d*x],x]
```

```
[Out] a*x + b*x*ArcCot[c + d*x] + (b*(-2*c*ArcTan[c + d*x] + Log[1 + c^2 + 2*c*d*
x + d^2*x^2]))/(2*d)
```

Maple [A] time = 0.041, size = 42, normalized size = 1.1

$$ax+b\mathrm{arccot}\left(dx+c\right)x+\frac{b\mathrm{arccot}\left(dx+c\right)c}{d}+\frac{b\ln\left(1+(dx+c)^2\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a+b*arccot(d*x+c),x)
```

```
[Out] a*x+b*arccot(d*x+c)*x+b/d*arccot(d*x+c)*c+1/2*b*ln(1+(d*x+c)^2)/d
```

Maxima [A] time = 0.985581, size = 46, normalized size = 1.21

$$ax+\frac{\left(2\left(dx+c\right)\mathrm{arccot}\left(dx+c\right)+\log\left((dx+c)^2+1\right)\right)b}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a+b*arccot(d*x+c),x, algorithm="maxima")
```

```
[Out] a*x + 1/2*(2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*b/d
```

Fricas [A] time = 2.14706, size = 140, normalized size = 3.68

$$\frac{2\,bdx\,\mathrm{arccot}\,(dx+c)+2\,adx-2\,bc\,\arctan\,(dx+c)+b\log\left(d^2x^2+2\,cdx+c^2+1\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a+b*arccot(d*x+c),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*d*x*arccot(d*x + c) + 2*a*d*x - 2*b*c*arctan(d*x + c) + b*log(d^2*
x^2 + 2*c*d*x + c^2 + 1))/d
```

Sympy [A] time = 0.490215, size = 51, normalized size = 1.34

$$ax+b\left(\begin{cases}\frac{c\,\mathrm{acot}\,(c+dx)}{d}+x\,\mathrm{acot}\,(c+dx)+\frac{\log\left(c^2+2cdx+d^2x^2+1\right)}{2d} & \text{for } d\neq 0\\ x\,\mathrm{acot}\,(c) & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a+b*acot(d*x+c),x)
```

```
[Out] a*x + b*Piecewise((c*acot(c + d*x)/d + x*acot(c + d*x) + log(c**2 + 2*c*d*x
 + d**2*x**2 + 1)/(2*d), Ne(d, 0)), (x*acot(c), True))
```

Giac [A] time = 1.09487, size = 77, normalized size = 2.03

$$-\frac{1}{2}\left(d\left(\frac{2\,c\arctan\,(dx+c)}{d^2}-\frac{\log\left(d^2x^2+2\,cdx+c^2+1\right)}{d^2}\right)-2\,x\arctan\left(\frac{1}{dx+c}\right)\right)b+ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(a+b*arccot(d*x+c),x, algorithm="giac")
```

```
[Out] -1/2*(d*(2*c*arctan(d*x + c)/d^2 - log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^2) -
2*x*arctan(1/(d*x + c)))*b + a*x
```

3.133 $\int \frac{a+b\cot^{-1}(c+dx)}{e+fx}\,dx$

Optimal. Leaf size=162

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{2f}-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-i(c+dx)}\right)}{2f}+\frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{f}$$

```
[Out] -(((a + b*ArcCot[c + d*x])*Log[2/(1 - I*(c + d*x))])/f) + ((a + b*ArcCot[c
+ d*x])*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f - ((I
/2)*b*PolyLog[2, 1 - 2/(1 - I*(c + d*x))])/f + ((I/2)*b*PolyLog[2, 1 - (2*d
*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f
```

Rubi [A] time = 0.148596, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {5048, 4857, 2402, 2315, 2447}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{2f}-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-i(c+dx)}\right)}{2f}+\frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])/(e + f*x),x]
```

```
[Out] -(((a + b*ArcCot[c + d*x])*Log[2/(1 - I*(c + d*x))])/f) + ((a + b*ArcCot[c
+ d*x])*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f - ((I
/2)*b*PolyLog[2, 1 - 2/(1 - I*(c + d*x))])/f + ((I/2)*b*PolyLog[2, 1 - (2*d
*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
```

```
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \frac{a+b\cot^{-1}(c+dx)}{e+fx}\,dx = \frac{\text{Subst}\left(\int \frac{a+b\cot^{-1}(x)}{\frac{de-cf}{d}+\frac{fx}{d}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2}{1-i(c+dx)}\right)}{f} + \frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2d(e+fx)}{(de+if-cf)(1-i(c+dx))}\right)}{f} - \frac{b\,\text{Su}}{}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2}{1-i(c+dx)}\right)}{f} + \frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2d(e+fx)}{(de+if-cf)(1-i(c+dx))}\right)}{f} + \frac{ib\text{L}}{}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2}{1-i(c+dx)}\right)}{f} + \frac{\left(a+b\cot^{-1}(c+dx)\right)\log\left(\frac{2d(e+fx)}{(de+if-cf)(1-i(c+dx))}\right)}{f} - \frac{ib\text{L}}{}$$

Mathematica [A] time = 0.0945604, size = 304, normalized size = 1.88

$$-\frac{ib\text{PolyLog}\left(2,\frac{f(c+dx)-cf+de}{de+(-c+i)f}\right)}{2f}+\frac{ib\text{PolyLog}\left(2,\frac{f(c+dx)-cf+de}{de-(c+i)f}\right)}{2f}+\frac{a\log(f(c+dx)-cf+de)}{f}-\frac{ib\log\left(\frac{f(-c-dx+i)}{de+(-c+i)f}\right)\log(f(c$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcCot[c + d*x])/(e + f*x),x]
```

```
[Out] (a*Log[d*e - c*f + f*(c + d*x)])/f - ((I/2)*b*Log[(f*(I - c - d*x))/(d*e +
(I - c)*f)]*Log[d*e - c*f + f*(c + d*x)])/f + ((I/2)*b*Log[-((I - c - d*x)/
(c + d*x))]*Log[d*e - c*f + f*(c + d*x)])/f + ((I/2)*b*Log[-((f*(I + c + d*
x))/(d*e - (I + c)*f))]*Log[d*e - c*f + f*(c + d*x)])/f - ((I/2)*b*Log[(I +
 c + d*x)/(c + d*x)]*Log[d*e - c*f + f*(c + d*x)])/f - ((I/2)*b*PolyLog[2,
(d*e - c*f + f*(c + d*x))/(d*e + (I - c)*f)])/f + ((I/2)*b*PolyLog[2, (d*e
- c*f + f*(c + d*x))/(d*e - (I + c)*f)])/f
```

Maple [A] time = 0.06, size = 224, normalized size = 1.4

$$\frac{a\ln\left(f(dx+c)-cf+de\right)}{f}+\frac{b\ln\left(f(dx+c)-cf+de\right)\operatorname{arccot}(dx+c)}{f}-\frac{\frac{i}{2}b\ln\left(f(dx+c)-cf+de\right)}{f}\ln\left(\frac{if-f(dx+c}{de+if-cf}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))/(f*x+e),x)
```

```
[Out] a*ln(f*(d*x+c)-c*f+d*e)/f+b*ln(f*(d*x+c)-c*f+d*e)/f*arccot(d*x+c)-1/2*I*b*l
n(f*(d*x+c)-c*f+d*e)/f*ln((I*f-f*(d*x+c))/(d*e+I*f-c*f))+1/2*I*b*ln(f*(d*x+
c)-c*f+d*e)/f*ln((I*f+f*(d*x+c))/(I*f+c*f-d*e))-1/2*I*b/f*dilog((I*f-f*(d*x
+c))/(d*e+I*f-c*f))+1/2*I*b/f*dilog((I*f+f*(d*x+c))/(I*f+c*f-d*e))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2b\int\frac{\arctan(1,dx+c)}{2\left(fx+e\right)}\,dx+\frac{a\log\left(fx+e\right)}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e),x, algorithm="maxima")
```

```
[Out] 2*b*integrate(1/2*arctan2(1, d*x + c)/(f*x + e), x) + a*log(f*x + e)/f
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\,\text{arccot}\,(dx+c)+a}{fx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e),x, algorithm="fricas")
```

```
[Out] integral((b*arccot(d*x + c) + a)/(f*x + e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\,\text{acot}\,(c+dx)}{e+fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))/(f*x+e),x)
```

```
[Out] Integral((a + b*acot(c + d*x))/(e + f*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\,\text{arccot}\,(dx+c)+a}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)/(f*x + e), x)
```

3.134 $\int \frac{a+b\cot^{-1}(c+dx)}{(e+fx)^2}\,dx$

Optimal. Leaf size=153

$$-\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)}+\frac{bd\log\left(c^2+2cdx+d^2x^2+1\right)}{2\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}-\frac{bd\log(e+fx)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}-\frac{bd(de-cf)\tan^{-1}(c+dx)}{f\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}$$

```
[Out] -((a + b*ArcCot[c + d*x])/(f*(e + f*x))) - (b*d*(d*e - c*f)*ArcTan[c + d*x]
)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)) - (b*d*Log[e + f*x])/(d^2*e^2 -
 2*c*d*e*f + (1 + c^2)*f^2) + (b*d*Log[1 + c^2 + 2*c*d*x + d^2*x^2])/(2*(d^
2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2))
```

Rubi [A] time = 0.110938, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {5046, 1982, 705, 31, 634, 618, 204, 628}

$$-\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)}+\frac{bd\log\left(c^2+2cdx+d^2x^2+1\right)}{2\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}-\frac{bd\log(e+fx)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}-\frac{bd(de-cf)\tan^{-1}(c+dx)}{f\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])/(e + f*x)^2,x]
```

```
[Out] -((a + b*ArcCot[c + d*x])/(f*(e + f*x))) - (b*d*(d*e - c*f)*ArcTan[c + d*x]
)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)) - (b*d*Log[e + f*x])/(d^2*e^2 -
 2*c*d*e*f + (1 + c^2)*f^2) + (b*d*Log[1 + c^2 + 2*c*d*x + d^2*x^2])/(2*(d^
2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2))
```

Rule 5046

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
 + d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 1982

```
Int[(u_)^(m_.)*(v_)^(p_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*ExpandToSum
[v, x]^p, x] /; FreeQ[{m, p}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !
```

```
(LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rubi steps

$$\int \frac{a+b\cot^{-1}(c+dx)}{(e+fx)^2}\,dx = -\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)} - \frac{(bd)\int \frac{1}{(e+fx)\left(1+(c+dx)^2\right)}\,dx}{f}$$

$$= -\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)} - \frac{(bd)\int \frac{1}{(e+fx)\left(1+c^2+2cdx+d^2x^2\right)}\,dx}{f}$$

$$= -\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)} - \frac{(bd)\int \frac{d^2e-2cdf-d^2fx}{1+c^2+2cdx+d^2x^2}\,dx}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} - \frac{(bdf)\int \frac{1}{e+fx}\,dx}{d^2e^2-2cdef+\left(1+c^2\right)f^2}$$

$$= -\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)} - \frac{bd\log(e+fx)}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{(bd)\int \frac{2cd+2d^2x}{1+c^2+2cdx+d^2x^2}\,dx}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} - \frac{\left(bd^2 \cdots\right.}{f\left(\cdots\right.}$$

$$= -\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)} - \frac{bd\log(e+fx)}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{bd\log\left(1+c^2+2cdx+d^2x^2\right)}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} + \frac{\left(2b \cdots\right.}{\cdots}$$

$$= -\frac{a+b\cot^{-1}(c+dx)}{f(e+fx)} - \frac{bd(de-cf)\tan^{-1}(c+dx)}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} - \frac{bd\log(e+fx)}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{bd\,\mathrm{l}\cdots}{2\left(d \cdots\right.}$$

Mathematica [C] time = 0.164227, size = 118, normalized size = 0.77

$$\frac{-\frac{a+b\cot^{-1}(c+dx)}{e+fx}+\frac{bd((-icf+ide+f)\log(-c-dx+i)+(icf-ide+f)\log(c+dx+i)-2f\log(d(e+fx)))}{2\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}}{f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcCot[c + d*x])/(e + f*x)^2,x]
```

```
[Out] (-((a + b*ArcCot[c + d*x])/(e + f*x)) + (b*d*((I*d*e + f - I*c*f)*Log[I - c
 - d*x] + ((-I)*d*e + f + I*c*f)*Log[I + c + d*x] - 2*f*Log[d*(e + f*x)]))/
(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)))/f
```

Maple [A] time = 0.051, size = 206, normalized size = 1.4

$$-\frac{ad}{\left(dfx+de\right)f} - \frac{bd\mathrm{arccot}\,(dx+c)}{\left(dfx+de\right)f} + \frac{bd\ln\left(1+(dx+c)^2\right)}{2\,c^2f^2-4\,cdef+2\,d^2e^2+2\,f^2} + \frac{bd\arctan\,(dx+c)\,c}{c^2f^2-2\,cdef+d^2e^2+f^2} - \frac{bd^2\arctan\,(d \cdots}{f\left(c^2f^2-2\,cdef+\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))/(f*x+e)^2,x)
```

```
[Out] -d*a/(d*f*x+d*e)/f-d*b/(d*f*x+d*e)/f*arccot(d*x+c)+1/2*d*b/(c^2*f^2-2*c*d*e
*f+d^2*e^2+f^2)*ln(1+(d*x+c)^2)+d*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(
d*x+c)*c-d^2*b/f/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)*e-d*b/(c^2*f
^2-2*c*d*e*f+d^2*e^2+f^2)*ln(f*(d*x+c)-c*f+d*e)
```

Maxima [A] time = 1.49717, size = 239, normalized size = 1.56

$$-\frac{1}{2}\left(d\left(\frac{2\left(d^2e-cdf\right)\arctan\left(\frac{d^2x+cd}{d}\right)}{\left(d^2e^2f-2\,cdef^2+\left(c^2+1\right)f^3\right)d}-\frac{\log\left(d^2x^2+2\,cdx+c^2+1\right)}{d^2e^2-2\,cdef+\left(c^2+1\right)f^2}+\frac{2\,\log\left(fx+e\right)}{d^2e^2-2\,cdef+\left(c^2+1\right)f^2}\right)+\frac{2\,\operatorname{arccot}\left(dx+c\right)}{f^2x+ef}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(d*(2*(d^2*e - c*d*f)*arctan((d^2*x + c*d)/d)/((d^2*e^2*f - 2*c*d*e*f^
2 + (c^2 + 1)*f^3)*d) - log(d^2*x^2 + 2*c*d*x + c^2 + 1)/(d^2*e^2 - 2*c*d*e
*f + (c^2 + 1)*f^2) + 2*log(f*x + e)/(d^2*e^2 - 2*c*d*e*f + (c^2 + 1)*f^2))
 + 2*arccot(d*x + c)/(f^2*x + e*f))*b - a/(f^2*x + e*f)
```

Fricas [A] time = 5.34871, size = 513, normalized size = 3.35

$$-\frac{2\,ad^2e^2-4\,acdef+2\left(ac^2+a\right)f^2+2\left(bd^2e^2-2\,bcdef+\left(bc^2+b\right)f^2\right)\operatorname{arccot}\left(dx+c\right)+2\left(bd^2e^2-bcdef+\left(bd^2ef-bc\right.\right.}{2\left(d^2e^3f-2\,cde^2f^2+\left(c^2+1\right)ef^3+\left(d^2e^2f^2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*d^2*e^2 - 4*a*c*d*e*f + 2*(a*c^2 + a)*f^2 + 2*(b*d^2*e^2 - 2*b*c*
d*e*f + (b*c^2 + b)*f^2)*arccot(d*x + c) + 2*(b*d^2*e^2 - b*c*d*e*f + (b*d^
2*e*f - b*c*d*f^2)*x)*arctan(d*x + c) - (b*d*f^2*x + b*d*e*f)*log(d^2*x^2 +
 2*c*d*x + c^2 + 1) + 2*(b*d*f^2*x + b*d*e*f)*log(f*x + e))/(d^2*e^3*f - 2*
c*d*e^2*f^2 + (c^2 + 1)*e*f^3 + (d^2*e^2*f^2 - 2*c*d*e*f^3 + (c^2 + 1)*f^4)
*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))/(f*x+e)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.1077, size = 396, normalized size = 2.59

$$\frac{1}{2}\left(df^2\left(\frac{\log\left(d^2+\frac{2\,cdf}{fx+e}+\frac{c^2f^2}{(fx+e)^2}-\frac{2\,d^2e}{fx+e}-\frac{2\,cdfe}{(fx+e)^2}+\frac{d^2e^2}{(fx+e)^2}+\frac{f^2}{(fx+e)^2}\right)}{c^2f^4-2\,cdf^3e+d^2f^2e^2+f^4}+\frac{2\left(cdf-d^2e\right)\arctan\left(-\frac{cdf+\frac{c^2f^2}{fx+e}-d^2e-\frac{2\,cdfe}{fx+e}+\frac{d^2e^2}{fx+e}+\frac{f^2}{fx+e}}{df}\right)}{\left(c^2f^3-2\,cdf^2e+d^2fe^2+f^3\right)df^2}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e)^2,x, algorithm="giac")
```

```
[Out] 1/2*(d*f^2*(log(d^2 + 2*c*d*f/(f*x + e) + c^2*f^2/(f*x + e)^2 - 2*d^2*e/(f*
x + e) - 2*c*d*f*e/(f*x + e)^2 + d^2*e^2/(f*x + e)^2 + f^2/(f*x + e)^2)/(c^
2*f^4 - 2*c*d*f^3*e + d^2*f^2*e^2 + f^4) + 2*(c*d*f - d^2*e)*arctan(-(c*d*f
 + c^2*f^2/(f*x + e) - d^2*e - 2*c*d*f*e/(f*x + e) + d^2*e^2/(f*x + e) + f^
2/(f*x + e))/(d*f))/((c^2*f^3 - 2*c*d*f^2*e + d^2*f*e^2 + f^3)*d*f^2)) - 2*
arctan(1/(d*x + c))/((f*x + e)*f))*b - a/((f*x + e)*f)
```

3.135 $\int \frac{a+b\cot^{-1}(c+dx)}{(e+fx)^3}\,dx$

Optimal. Leaf size=228

$$-\frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2}+\frac{bd^2(de-cf)\log\left(c^2+2cdx+d^2x^2+1\right)}{2\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)^2}+\frac{bd}{2(e+fx)\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}-\frac{bd^2(de-c}{\left(\left(c^2+1\right)f^2-\right.}$$

```
[Out] (b*d)/(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)*(e + f*x)) - (a + b*ArcCot[c
 + d*x])/(2*f*(e + f*x)^2) - (b*d^2*(d*e + f - c*f)*(d*e - (1 + c)*f)*ArcTa
n[c + d*x])/(2*f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)^2) - (b*d^2*(d*e - c
*f)*Log[e + f*x])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)^2 + (b*d^2*(d*e - c
*f)*Log[1 + c^2 + 2*c*d*x + d^2*x^2])/(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f
^2)^2)
```

Rubi [A] time = 0.278451, antiderivative size = 228, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {5046, 1982, 709, 800, 634, 618, 204, 628}

$$-\frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2}+\frac{bd^2(de-cf)\log\left(c^2+2cdx+d^2x^2+1\right)}{2\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)^2}+\frac{bd}{2(e+fx)\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}-\frac{bd^2(de-c}{\left(\left(c^2+1\right)f^2-\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])/(e + f*x)^3,x]
```


```
[Out] (b*d)/(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)*(e + f*x)) - (a + b*ArcCot[c
 + d*x])/(2*f*(e + f*x)^2) - (b*d^2*(d*e + f - c*f)*(d*e - (1 + c)*f)*ArcTa
n[c + d*x])/(2*f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)^2) - (b*d^2*(d*e - c
*f)*Log[e + f*x])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)^2 + (b*d^2*(d*e - c
*f)*Log[1 + c^2 + 2*c*d*x + d^2*x^2])/(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f
^2)^2)
```


Rule 5046

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
 + d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 1982

```
Int[(u_)^(m_.)*(v_)^(p_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*ExpandToSum
[v, x]^p, x] /; FreeQ[{m, p}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !
(LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rule 709

```
Int[((d_.) + (e_.)*(x_))^(m_)/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol
] :> Simp[(e*(d + e*x)^(m + 1))/((m + 1)*(c*d^2 - b*d*e + a*e^2)), x] + Dis
t[1/(c*d^2 - b*d*e + a*e^2), Int[((d + e*x)^(m + 1)*Simp[c*d - b*e - c*e*x,
 x])/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 -
 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && NeQ[2*c*d - b*e, 0] && LtQ[m
, -1]
```

Rule 800

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_.) + (b_.)*(x_) +
(c_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a
+ b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[b^2 - 4*a*
c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegerQ[m]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
```

e}, x] && EqQ[2*c*d - b*e, 0]

Rubi steps

$$\int \frac{a+b\cot^{-1}(c+dx)}{(e+fx)^3}\,dx = -\frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{(bd)\int \frac{1}{(e+fx)^2\left(1+(c+dx)^2\right)}\,dx}{2f}$$

$$= -\frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{(bd)\int \frac{1}{(e+fx)^2\left(1+c^2+2cdx+d^2x^2\right)}\,dx}{2f}$$

$$= \frac{bd}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+fx)} - \frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{(bd)\int \frac{d(de-2cf)-d^2fx}{(e+fx)\left(1+c^2+2cdx+d^2x^2\right)}}{2f\left(d^2e^2-2cdef+\left(1+c^2\right)\right.}$$

$$= \frac{bd}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+fx)} - \frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{(bd)\int \left(\frac{2df^2(de-cf)}{\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+}\right.}{2f\left(d^2e^2\right.}$$

$$= \frac{bd}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+fx)} - \frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{bd^2(de-cf)\log(e+fx)}{\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)}$$

$$= \frac{bd}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+fx)} - \frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{bd^2(de-cf)\log(e+fx)}{\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)}$$

$$= \frac{bd}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+fx)} - \frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{bd^2(de-cf)\log(e+fx)}{\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)}$$

$$= \frac{bd}{2\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(e+fx)} - \frac{a+b\cot^{-1}(c+dx)}{2f(e+fx)^2} - \frac{bd^2(de-f-cf)(de+f-cf}{2f\left(d^2e^2-2cdef+f^2\right.}$$

Mathematica [C] time = 0.502029, size = 180, normalized size = 0.79

$$\frac{-\frac{a+b\cot^{-1}(c+dx)}{(e+fx)^2}+\frac{bdf}{(e+fx)\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)}-\frac{2bd^2f(de-cf)\log(d(e+fx))}{\left(\left(c^2+1\right)f^2-2cdef+d^2e^2\right)^2}+\frac{ibd^2\log(-c-dx+i)}{2(de-(c-i)f)^2}-\frac{ibd^2\log(c+dx+i)}{2(de-(c+i)f)^2}}{2f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcCot[c + d*x])/(e + f*x)^3,x]
```

```
[Out] ((b*d*f)/((d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)*(e + f*x)) - (a + b*ArcCot[
c + d*x])/(e + f*x)^2 + ((I/2)*b*d^2*Log[I - c - d*x])/(d*e - (-I + c)*f)^2
 - ((I/2)*b*d^2*Log[I + c + d*x])/(d*e - (I + c)*f)^2 - (2*b*d^2*f*(d*e - c
*f)*Log[d*(e + f*x)])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)^2)/(2*f)
```

Maple [A] time = 0.059, size = 437, normalized size = 1.9

$$-\frac{d^2a}{2\left(dfx+de\right)^2 f}-\frac{bd^2\mathrm{arccot}\left(dx+c\right)}{2\left(dfx+de\right)^2 f}-\frac{bd^2 f\arctan\left(dx+c\right)c^2}{2\left(c^2f^2-2\,cdef+d^2e^2+f^2\right)^2}+\frac{bd^3\arctan\left(dx+c\right)ce}{\left(c^2f^2-2\,cdef+d^2e^2+f^2\right)^2}-\frac{d^4b\,\mathrm{ar}}{2\left(c^2f^2-2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))/(f*x+e)^3,x)
```

```
[Out] -1/2*d^2*a/(d*f*x+d*e)^2/f-1/2*d^2*b/(d*f*x+d*e)^2/f*arccot(d*x+c)-1/2*d^2*
b*f/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)^2*arctan(d*x+c)*c^2+d^3*b/(c^2*f^2-2*c*
d*e*f+d^2*e^2+f^2)^2*arctan(d*x+c)*c*e-1/2*d^4*b/f/(c^2*f^2-2*c*d*e*f+d^2*e
^2+f^2)^2*arctan(d*x+c)*e^2-1/2*d^2*b*f/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)^2*l
n(1+(d*x+c)^2)*c+1/2*d^3*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)^2*ln(1+(d*x+c)^2
)*e+1/2*d^2*b*f/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)^2*arctan(d*x+c)+1/2*d^2*b/(
c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)/(d*f*x+d*e)+d^2*b*f/(c^2*f^2-2*c*d*e*f+d^2*e
^2+f^2)^2*ln(f*(d*x+c)-c*f+d*e)*c-d^3*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)^2*l
n(f*(d*x+c)-c*f+d*e)*e
```

Maxima [A] time = 1.52127, size = 554, normalized size = 2.43

$$\frac{1}{2}\left(d\left(\frac{\left(d^2e-cdf\right)\log\left(d^2x^2+2\,cdx+c^2+1\right)}{d^4e^4-4\,cd^3e^3f+2\left(3\,c^2+1\right)d^2e^2f^2-4\left(c^3+c\right)def^3+\left(c^4+2\,c^2+1\right)f^4}-\frac{2\left(d^2e-cdf\right)\mathrm{lo}}{d^4e^4-4\,cd^3e^3f+2\left(3\,c^2+1\right)d^2e^2f^2-}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(d*((d^2*e - c*d*f)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/(d^4*e^4 - 4*c*d^3
*e^3*f + 2*(3*c^2 + 1)*d^2*e^2*f^2 - 4*(c^3 + c)*d*e*f^3 + (c^4 + 2*c^2 + 1
)*f^4) - 2*(d^2*e - c*d*f)*log(f*x + e)/(d^4*e^4 - 4*c*d^3*e^3*f + 2*(3*c^2
 + 1)*d^2*e^2*f^2 - 4*(c^3 + c)*d*e*f^3 + (c^4 + 2*c^2 + 1)*f^4) - (d^4*e^2
```

```
 - 2*c*d^3*e*f + (c^2 - 1)*d^2*f^2)*arctan((d^2*x + c*d)/d)/((d^4*e^4*f - 4
*c*d^3*e^3*f^2 + 2*(3*c^2 + 1)*d^2*e^2*f^3 - 4*(c^3 + c)*d*e*f^4 + (c^4 + 2
*c^2 + 1)*f^5)*d) + 1/(d^2*e^3 - 2*c*d*e^2*f + (c^2 + 1)*e*f^2 + (d^2*e^2*f
 - 2*c*d*e*f^2 + (c^2 + 1)*f^3)*x)) - arccot(d*x + c)/(f^3*x^2 + 2*e*f^2*x
+ e^2*f))*b - 1/2*a/(f^3*x^2 + 2*e*f^2*x + e^2*f)
```

Fricas [B] time = 20.4374, size = 1531, normalized size = 6.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a*d^4*e^4 - (4*a*c + b)*d^3*e^3*f + 2*(3*a*c^2 + b*c + a)*d^2*e^2*f^2
 - (4*a*c^3 + b*c^2 + 4*a*c + b)*d*e*f^3 + (a*c^4 + 2*a*c^2 + a)*f^4 - (b*d
^3*e^2*f^2 - 2*b*c*d^2*e*f^3 + (b*c^2 + b)*d*f^4)*x + (b*d^4*e^4 - 4*b*c*d^
3*e^3*f + 2*(3*b*c^2 + b)*d^2*e^2*f^2 - 4*(b*c^3 + b*c)*d*e*f^3 + (b*c^4 +
2*b*c^2 + b)*f^4)*arccot(d*x + c) + (b*d^4*e^4 - 2*b*c*d^3*e^3*f + (b*c^2 -
 b)*d^2*e^2*f^2 + (b*d^4*e^2*f^2 - 2*b*c*d^3*e*f^3 + (b*c^2 - b)*d^2*f^4)*x
^2 + 2*(b*d^4*e^3*f - 2*b*c*d^3*e^2*f^2 + (b*c^2 - b)*d^2*e*f^3)*x)*arctan(
d*x + c) - (b*d^3*e^3*f - b*c*d^2*e^2*f^2 + (b*d^3*e*f^3 - b*c*d^2*f^4)*x^2
 + 2*(b*d^3*e^2*f^2 - b*c*d^2*e*f^3)*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1) +
2*(b*d^3*e^3*f - b*c*d^2*e^2*f^2 + (b*d^3*e*f^3 - b*c*d^2*f^4)*x^2 + 2*(b*d
^3*e^2*f^2 - b*c*d^2*e*f^3)*x)*log(f*x + e))/(d^4*e^6*f - 4*c*d^3*e^5*f^2 +
 2*(3*c^2 + 1)*d^2*e^4*f^3 - 4*(c^3 + c)*d*e^3*f^4 + (c^4 + 2*c^2 + 1)*e^2*
f^5 + (d^4*e^4*f^3 - 4*c*d^3*e^3*f^4 + 2*(3*c^2 + 1)*d^2*e^2*f^5 - 4*(c^3 +
 c)*d*e*f^6 + (c^4 + 2*c^2 + 1)*f^7)*x^2 + 2*(d^4*e^5*f^2 - 4*c*d^3*e^4*f^3
 + 2*(3*c^2 + 1)*d^2*e^3*f^4 - 4*(c^3 + c)*d*e^2*f^5 + (c^4 + 2*c^2 + 1)*e*
f^6)*x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))/(f*x+e)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 6.61449, size = 1550, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))/(f*x+e)^3,x, algorithm="giac")
```

```
[Out] -1/2*(b*c^2*d^2*f^4*x^2*arctan(d*x + c) - 2*b*c*d^3*f^3*x^2*arctan(d*x + c)
*e + b*d^4*f^2*x^2*arctan(d*x + c)*e^2 + 2*b*c^2*d^2*f^3*x*arctan(d*x + c)*
e + b*c*d^2*f^4*x^2*log(d^2*x^2 + 2*c*d*x + c^2 + 1) - b*d^3*f^3*x^2*e*log(
d^2*x^2 + 2*c*d*x + c^2 + 1) - 2*b*c*d^2*f^4*x^2*log(abs(f*x + e)) + 2*b*d^
3*f^3*x^2*e*log(abs(f*x + e)) - b*d^2*f^4*x^2*arctan(d*x + c) + b*c^4*f^4*a
rctan(1/(d*x + c)) - 4*b*c*d^3*f^2*x*arctan(d*x + c)*e^2 - 4*b*c^3*d*f^3*ar
ctan(1/(d*x + c))*e + 2*b*c*d^2*f^3*x*e*log(d^2*x^2 + 2*c*d*x + c^2 + 1) -
4*b*c*d^2*f^3*x*e*log(abs(f*x + e)) + a*c^4*f^4 - b*c^2*d*f^4*x + 2*b*d^4*f
*x*arctan(d*x + c)*e^3 + b*c^2*d^2*f^2*arctan(d*x + c)*e^2 + 6*b*c^2*d^2*f^
2*arctan(1/(d*x + c))*e^2 - 4*a*c^3*d*f^3*e + 2*b*c*d^2*f^3*x*e - 2*b*d^2*f
^3*x*arctan(d*x + c)*e - 2*b*d^3*f^2*x*e^2*log(d^2*x^2 + 2*c*d*x + c^2 + 1)
 + 4*b*d^3*f^2*x*e^2*log(abs(f*x + e)) + 2*b*c^2*f^4*arctan(1/(d*x + c)) -
2*b*c*d^3*f*arctan(d*x + c)*e^3 - 4*b*c*d^3*f*arctan(1/(d*x + c))*e^3 + 6*a
*c^2*d^2*f^2*e^2 - b*d^3*f^2*x*e^2 - b*c^2*d*f^3*e - 4*b*c*d*f^3*arctan(1/(
d*x + c))*e + b*c*d^2*f^2*e^2*log(d^2*x^2 + 2*c*d*x + c^2 + 1) - 2*b*c*d^2*
f^2*e^2*log(abs(f*x + e)) + 2*a*c^2*f^4 - b*d*f^4*x + b*d^4*arctan(d*x + c)
*e^4 + b*d^4*arctan(1/(d*x + c))*e^4 - 4*a*c*d^3*f*e^3 + 2*b*c*d^2*f^2*e^2
- b*d^2*f^2*arctan(d*x + c)*e^2 + 2*b*d^2*f^2*arctan(1/(d*x + c))*e^2 - 4*a
*c*d*f^3*e - b*d^3*f*e^3*log(d^2*x^2 + 2*c*d*x + c^2 + 1) + 2*b*d^3*f*e^3*l
og(abs(f*x + e)) + b*f^4*arctan(1/(d*x + c)) + a*d^4*e^4 - b*d^3*f*e^3 + 2*
a*d^2*f^2*e^2 - b*d*f^3*e + a*f^4)/(c^4*f^7*x^2 - 4*c^3*d*f^6*x^2*e + 6*c^2
*d^2*f^5*x^2*e^2 + 2*c^4*f^6*x*e + 2*c^2*f^7*x^2 - 4*c*d^3*f^4*x^2*e^3 - 8*
c^3*d*f^5*x*e^2 - 4*c*d*f^6*x^2*e + d^4*f^3*x^2*e^4 + 12*c^2*d^2*f^4*x*e^3
+ c^4*f^5*e^2 + 2*d^2*f^5*x^2*e^2 + 4*c^2*f^6*x*e + f^7*x^2 - 8*c*d^3*f^3*x
*e^4 - 4*c^3*d*f^4*e^3 - 8*c*d*f^5*x*e^2 + 2*d^4*f^2*x*e^5 + 6*c^2*d^2*f^3*
e^4 + 4*d^2*f^4*x*e^3 + 2*c^2*f^5*e^2 + 2*f^6*x*e - 4*c*d^3*f^2*e^5 - 4*c*d
*f^4*e^3 + d^4*f*e^6 + 2*d^2*f^3*e^4 + f^5*e^2)
```

3.136 $\int (e+fx)^2 \left(a+b\cot^{-1}(c+dx)\right)^2 dx$

Optimal. Leaf size=382

$$\frac{ib^2\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{3d^3}+\frac{i\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\left(a+b\cot^{-1}(c+dx)\right)}{3d^3}$$

```
[Out] (b^2*f^2*x)/(3*d^2) + (2*a*b*f*(d*e - c*f)*x)/d^2 + (2*b^2*f*(d*e - c*f)*(c
 + d*x)*ArcCot[c + d*x])/d^3 + (b*f^2*(c + d*x)^2*(a + b*ArcCot[c + d*x]))/
(3*d^3) + ((I/3)*(3*d^2*e^2 - 6*c*d*e*f - (1 - 3*c^2)*f^2)*(a + b*ArcCot[c
+ d*x])^2)/d^3 - ((d*e - c*f)*(d^2*e^2 - 2*c*d*e*f - (3 - c^2)*f^2)*(a + b*
ArcCot[c + d*x])^2)/(3*d^3*f) + ((e + f*x)^3*(a + b*ArcCot[c + d*x])^2)/(3*
f) - (b^2*f^2*ArcTan[c + d*x])/(3*d^3) - (2*b*(3*d^2*e^2 - 6*c*d*e*f - (1 -
 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/(3*d^3) + (b
^2*f*(d*e - c*f)*Log[1 + (c + d*x)^2])/d^3 + ((I/3)*b^2*(3*d^2*e^2 - 6*c*d*
e*f - (1 - 3*c^2)*f^2)*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/d^3
```

Rubi [A] time = 0.582392, antiderivative size = 382, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 13, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.65, Rules used = {5048, 4865, 4847, 260, 4853, 321, 203, 4985, 4885, 4921, 4855, 2402, 2315}

$$\frac{ib^2\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{3d^3}+\frac{i\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\left(a+b\cot^{-1}(c+dx)\right)}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^2*(a + b*ArcCot[c + d*x])^2,x]
```


```
[Out] (b^2*f^2*x)/(3*d^2) + (2*a*b*f*(d*e - c*f)*x)/d^2 + (2*b^2*f*(d*e - c*f)*(c
 + d*x)*ArcCot[c + d*x])/d^3 + (b*f^2*(c + d*x)^2*(a + b*ArcCot[c + d*x]))/
(3*d^3) + ((I/3)*(3*d^2*e^2 - 6*c*d*e*f - (1 - 3*c^2)*f^2)*(a + b*ArcCot[c
+ d*x])^2)/d^3 - ((d*e - c*f)*(d^2*e^2 - 2*c*d*e*f - (3 - c^2)*f^2)*(a + b*
ArcCot[c + d*x])^2)/(3*d^3*f) + ((e + f*x)^3*(a + b*ArcCot[c + d*x])^2)/(3*
f) - (b^2*f^2*ArcTan[c + d*x])/(3*d^3) - (2*b*(3*d^2*e^2 - 6*c*d*e*f - (1 -
 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/(3*d^3) + (b
^2*f*(d*e - c*f)*Log[1 + (c + d*x)^2])/d^3 + ((I/3)*b^2*(3*d^2*e^2 - 6*c*d*
e*f - (1 - 3*c^2)*f^2)*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/d^3
```


Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4865

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x])^p)/(e*(q + 1)), x] + D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcCot[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rule 4985

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcCot[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (e+fx)^2 \left(a+b\cot^{-1}(c+dx)\right)^2 dx = \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)^2 \left(a+b\cot^{-1}(x)\right)^2 dx, x, c+dx\right)}{d}$$

$$= \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)^2}{3f} + \frac{(2b)\,\text{Subst}\left(\int \left(\frac{3f^2(de-cf)\left(a+b\cot^{-1}(x)\right)}{d^3} + \frac{f^3x(a\cdots}{\cdots}\right.\right.}{\cdots}$$

$$= \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)^2}{3f} + \frac{(2b)\,\text{Subst}\left(\int \frac{\left((de-cf)\left(d^2e^2-2cdef-3f^2+c^2f^2\right)+f(3\cdots\right.}{1\cdots}\right.}{3\cdots}$$

$$= \frac{2abf(de-cf)x}{d^2} + \frac{bf^2(c+dx)^2\left(a+b\cot^{-1}(c+dx)\right)}{3d^3} + \frac{(e+fx)^3\left(a+b\cot^{-1}(\cdots\right.}{3f}$$

$$= \frac{b^2f^2x}{3d^2} + \frac{2abf(de-cf)x}{d^2} + \frac{2b^2f(de-cf)(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2(c+dx)^2\cdots}{\cdots}$$

$$= \frac{b^2f^2x}{3d^2} + \frac{2abf(de-cf)x}{d^2} + \frac{2b^2f(de-cf)(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2(c+dx)^2\cdots}{\cdots}$$

$$= \frac{b^2f^2x}{3d^2} + \frac{2abf(de-cf)x}{d^2} + \frac{2b^2f(de-cf)(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2(c+dx)^2\cdots}{\cdots}$$

$$= \frac{b^2f^2x}{3d^2} + \frac{2abf(de-cf)x}{d^2} + \frac{2b^2f(de-cf)(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2(c+dx)^2\cdots}{\cdots}$$

$$= \frac{b^2f^2x}{3d^2} + \frac{2abf(de-cf)x}{d^2} + \frac{2b^2f(de-cf)(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2(c+dx)^2\cdots}{\cdots}$$

Mathematica [A] time = 4.98049, size = 665, normalized size = 1.74

$$\frac{b^2ef\left(-2ic\,\text{PolyLog}\left(2,e^{2i\cot^{-1}(c+dx)}\right)+\left(-c^2-2ic+d^2x^2+1\right)\cot^{-1}(c+dx)^2-2\log\left(\frac{1}{(c+dx)\sqrt{\frac{1}{(c+dx)^2}+1}}\right)+2\cot^{-1}(c+dx\cdots\right.}{d^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e + f*x)^2*(a + b*ArcCot[c + d*x])^2,x]
```

```
[Out] a^2*e^2*x + a^2*e*f*x^2 + (a^2*f^2*x^3)/3 + (a*b*(d*f*x*(6*d*e - 4*c*f + d*
f*x) + 2*d^3*x*(3*e^2 + 3*e*f*x + f^2*x^2)*ArcCot[c + d*x] - 2*(3*c*d^2*e^2
 + 3*d*e*f - 3*c^2*d*e*f - 3*c*f^2 + c^3*f^2)*ArcTan[c + d*x] + (3*d^2*e^2
- 6*c*d*e*f + (-1 + 3*c^2)*f^2)*Log[1 + c^2 + 2*c*d*x + d^2*x^2]))/(3*d^3)
+ (b^2*e^2*(ArcCot[c + d*x]*((I + c + d*x)*ArcCot[c + d*x] - 2*Log[1 - E^((
2*I)*ArcCot[c + d*x])]) + I*PolyLog[2, E^((2*I)*ArcCot[c + d*x])]))/d + (b^
2*e*f*((1 - (2*I)*c - c^2 + d^2*x^2)*ArcCot[c + d*x]^2 + 2*ArcCot[c + d*x]*
(c + d*x + 2*c*Log[1 - E^((2*I)*ArcCot[c + d*x])]) - 2*Log[1/((c + d*x)*Sqr
t[1 + (c + d*x)^(-2)])] - (2*I)*c*PolyLog[2, E^((2*I)*ArcCot[c + d*x])]))/d
^2 + (b^2*f^2*((c + d*x)*(1 + (c + d*x)^2)*(1 - 6*c*ArcCot[c + d*x] + 3*(1
+ c^2)*ArcCot[c + d*x]^2) - (c + d*x)*Sqrt[1 + (c + d*x)^(-2)]*(1 + (c + d*
x)^2)*(1 - 6*c*ArcCot[c + d*x] + (-1 + 3*c^2)*ArcCot[c + d*x]^2)*Cos[3*ArcC
ot[c + d*x]] + 2*(1 + (c + d*x)^2)*((-I)*ArcCot[c + d*x]^2*(1 - (6*I)*c - 3
*c^2 + (-1 + 3*c^2)*Cos[2*ArcCot[c + d*x]]) + 2*ArcCot[c + d*x]*(1 + (1 - 3
*c^2)*Log[1 - E^((2*I)*ArcCot[c + d*x])] + (-1 + 3*c^2)*Cos[2*ArcCot[c + d*
x]]*Log[1 - E^((2*I)*ArcCot[c + d*x])]) - 6*c*(-1 + Cos[2*ArcCot[c + d*x]])
*Log[1/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)])]) + (4*I)*(-1 + 3*c^2)*PolyLog[
2, E^((2*I)*ArcCot[c + d*x])]))/(12*d^3)
```

Maple [B] time = 0.153, size = 1832, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^2*(a+b*arccot(d*x+c))^2,x)
```

```
[Out] a^2*x*e^2+1/3*a^2*f^2*x^3+2/3*a*b/f*arctan(d*x+c)*e^3+2/3*a*b/f*arccot(d*x+
c)*e^3+2*arccot(d*x+c)*x*a*b*e^2+2/3*a*b*f^2*arccot(d*x+c)*x^3+b^2*f*arccot
(d*x+c)^2*e*x^2+2/3*b^2/f*arccot(d*x+c)*arctan(d*x+c)*e^3+1/6*I/d^3*b^2*dil
og(1/2*I*(d*x+c-I))*f^2-1/2*I/d*b^2*dilog(1/2*I*(d*x+c-I))*e^2+1/4*I/d*b^2*
ln(d*x+c-I)^2*e^2-1/4*I/d*b^2*ln(d*x+c+I)^2*e^2+1/2*I/d*b^2*dilog(-1/2*I*(d
*x+c+I))*e^2+1/12*I/d^3*b^2*ln(d*x+c+I)^2*f^2+1/d^2*b^2*f*ln(1+(d*x+c)^2)*e
-1/d^2*b^2*f*arctan(d*x+c)^2*e-1/3/d^3*b^2*f^2*arccot(d*x+c)*ln(1+(d*x+c)^2
)-1/d*b^2*arctan(d*x+c)^2*c*e^2+1/d*b^2*arccot(d*x+c)*ln(1+(d*x+c)^2)*e^2-1
/3/d^3*b^2*f^2*arctan(d*x+c)^2*c^3+1/3/d*a*b*f^2*x^2-1/6*I/d^3*b^2*dilog(-1
/2*I*(d*x+c+I))*f^2-1/d^3*b^2*f^2*ln(1+(d*x+c)^2)*c+1/d^3*b^2*f^2*arctan(d*
x+c)^2*c-1/3/d^3*a*b*f^2*ln(1+(d*x+c)^2)-5/3/d^3*b^2*f^2*arccot(d*x+c)*c^2+
1/3/d*b^2*f^2*arccot(d*x+c)*x^2+1/d*a*b*ln(1+(d*x+c)^2)*e^2-5/3/d^3*a*b*f^2
*c^2+I/d^2*b^2*ln(d*x+c-I)*ln(1+(d*x+c)^2)*c*e*f-I/d^2*b^2*ln(d*x+c-I)*ln(-
1/2*I*(d*x+c+I))*c*e*f-I/d^2*b^2*ln(1+(d*x+c)^2)*ln(d*x+c+I)*c*e*f+I/d^2*b^
2*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))*c*e*f+1/d^3*a*b*f^2*ln(1+(d*x+c)^2)*c^2-2
```

```
/d^2*a*b*f*arctan(d*x+c)*e-2/d*b^2*arccot(d*x+c)*arctan(d*x+c)*c*e^2-2/d*a*
b*arctan(d*x+c)*c*e^2+2/d^3*b^2*f^2*arccot(d*x+c)*arctan(d*x+c)*c-4/3/d^2*b
^2*f^2*arccot(d*x+c)*c*x+2/d*b^2*f*arccot(d*x+c)*e*x+2/d^2*b^2*f*arccot(d*x
+c)*e*c-2/3/d^3*a*b*f^2*arctan(d*x+c)*c^3+2/d^2*a*b*f*c*e-1/6*I/d^3*b^2*ln(
d*x+c-I)*ln(-1/2*I*(d*x+c+I))*f^2+1/6*I/d^3*b^2*ln(d*x+c-I)*ln(1+(d*x+c)^2)
*f^2-1/2*I/d^3*b^2*dilog(1/2*I*(d*x+c-I))*c^2*f^2-1/6*I/d^3*b^2*ln(1+(d*x+c
)^2)*ln(d*x+c+I)*f^2+1/2*I/d*b^2*ln(1+(d*x+c)^2)*ln(d*x+c+I)*e^2-1/2*I/d*b^
2*ln(d*x+c-I)*ln(1+(d*x+c)^2)*e^2+1/6*I/d^3*b^2*ln(d*x+c+I)*ln(1/2*I*(d*x+c
-I))*f^2-1/4*I/d^3*b^2*ln(d*x+c+I)^2*c^2*f^2+1/4*I/d^3*b^2*ln(d*x+c-I)^2*c^
2*f^2-2/d^2*b^2*f*arccot(d*x+c)*arctan(d*x+c)*e-2/3/d^3*b^2*f^2*arccot(d*x+
c)*arctan(d*x+c)*c^3+1/d^3*b^2*f^2*arccot(d*x+c)*ln(1+(d*x+c)^2)*c^2-1/2*I/
d*b^2*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))*e^2+1/2*I/d*b^2*ln(d*x+c-I)*ln(-1/2*I
*(d*x+c+I))*e^2+1/2*I/d^3*b^2*dilog(-1/2*I*(d*x+c+I))*c^2*f^2-4/3*a*b/d^2*f
^2*c*x+2*a*b/d*f*e*x+2*a*b*f*arccot(d*x+c)*e*x^2+1/d^2*b^2*f*arctan(d*x+c)^
2*c^2*e+2/d^3*a*b*f^2*arctan(d*x+c)*c-1/12*I/d^3*b^2*ln(d*x+c-I)^2*f^2+2/d^
2*b^2*f*arccot(d*x+c)*arctan(d*x+c)*c^2*e-I/d^2*b^2*dilog(-1/2*I*(d*x+c+I))
*c*e*f+1/2*I/d^2*b^2*ln(d*x+c+I)^2*c*e*f+1/3*b^2*f^2*arccot(d*x+c)^2*x^3+ar
ccot(d*x+c)^2*x*b^2*e^2+a^2*f*x^2*e+1/3*b^2/f*arctan(d*x+c)^2*e^3+1/3*b^2/f
*arccot(d*x+c)^2*e^3+1/3/d^3*b^2*f^2*c+1/3*a^2/f*e^3+1/2*I/d^3*b^2*ln(1+(d*
x+c)^2)*ln(d*x+c+I)*c^2*f^2-1/2*I/d^3*b^2*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))*c
^2*f^2-1/2*I/d^2*b^2*ln(d*x+c-I)^2*c*e*f+1/2*I/d^3*b^2*ln(d*x+c-I)*ln(-1/2*
I*(d*x+c+I))*c^2*f^2-1/2*I/d^3*b^2*ln(d*x+c-I)*ln(1+(d*x+c)^2)*c^2*f^2+I/d^
2*b^2*dilog(1/2*I*(d*x+c-I))*c*e*f+2/d^2*a*b*f*arctan(d*x+c)*c^2*e-2/d^2*b^
2*f*arccot(d*x+c)*ln(1+(d*x+c)^2)*c*e-2/d^2*a*b*f*ln(1+(d*x+c)^2)*c*e+1/3*b
^2*f^2*x/d^2-1/3*b^2*f^2*arctan(d*x+c)/d^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/12*b^2*f^2*x^3*arctan2(1, d*x + c)^2 + 1/4*b^2*e*f*x^2*arctan2(1, d*x + c
)^2 + 1/3*a^2*f^2*x^3 + 1/4*b^2*e^2*x*arctan2(1, d*x + c)^2 + a^2*e*f*x^2 +
 2*(x^2*arccot(d*x + c) + d*(x/d^2 + (c^2 - 1)*arctan((d^2*x + c*d)/d)/d^3
- c*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^3))*a*b*e*f + 1/3*(2*x^3*arccot(d*x
+ c) + d*((d*x^2 - 4*c*x)/d^3 - 2*(c^3 - 3*c)*arctan((d^2*x + c*d)/d)/d^4 +
 (3*c^2 - 1)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^4))*a*b*f^2 + a^2*e^2*x + (
2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*a*b*e^2/d - 1/48*(b^2*f
^2*x^3 + 3*b^2*e*f*x^2 + 3*b^2*e^2*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 +
```

```
integrate(1/48*(36*b^2*d^2*f^2*x^4*arctan2(1, d*x + c)^2 + 8*(9*b^2*d^2*e*f
*arctan2(1, d*x + c)^2 + (9*b^2*c*arctan2(1, d*x + c)^2 + b^2*arctan2(1, d*
x + c))*d*f^2)*x^3 + 36*(b^2*c^2*arctan2(1, d*x + c)^2 + b^2*arctan2(1, d*x
 + c)^2)*e^2 + 12*(3*b^2*d^2*e^2*arctan2(1, d*x + c)^2 + 2*(6*b^2*c*arctan2
(1, d*x + c)^2 + b^2*arctan2(1, d*x + c))*d*e*f + 3*(b^2*c^2*arctan2(1, d*x
 + c)^2 + b^2*arctan2(1, d*x + c)^2)*f^2)*x^2 + 3*(b^2*d^2*f^2*x^4 + 2*(b^2
*d^2*e*f + b^2*c*d*f^2)*x^3 + (b^2*c^2 + b^2)*e^2 + (b^2*d^2*e^2 + 4*b^2*c*
d*e*f + (b^2*c^2 + b^2)*f^2)*x^2 + 2*(b^2*c*d*e^2 + (b^2*c^2 + b^2)*e*f)*x)
*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 24*((3*b^2*c*arctan2(1, d*x + c)^2 +
b^2*arctan2(1, d*x + c))*d*e^2 + 3*(b^2*c^2*arctan2(1, d*x + c)^2 + b^2*arc
tan2(1, d*x + c)^2)*e*f)*x + 4*(b^2*d^2*f^2*x^4 + 3*b^2*c*d*e^2*x + (3*b^2*
d^2*e*f + b^2*c*d*f^2)*x^3 + 3*(b^2*d^2*e^2 + b^2*c*d*e*f)*x^2)*log(d^2*x^2
 + 2*c*d*x + c^2 + 1))/(d^2*x^2 + 2*c*d*x + c^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(a^2f^2x^2 + 2\,a^2efx + a^2e^2 + \left(b^2f^2x^2 + 2\,b^2efx + b^2e^2\right)\operatorname{arccot}(dx+c)^2 + 2\left(abf^2x^2 + 2\,abefx + abe^2\right)\operatorname{arccot}(d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral(a^2*f^2*x^2 + 2*a^2*e*f*x + a^2*e^2 + (b^2*f^2*x^2 + 2*b^2*e*f*x +
 b^2*e^2)*arccot(d*x + c)^2 + 2*(a*b*f^2*x^2 + 2*a*b*e*f*x + a*b*e^2)*arcco
t(d*x + c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\operatorname{acot}(c+dx))^2 \left(e+fx\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*(a+b*acot(d*x+c))**2,x)
```

```
[Out] Integral((a + b*acot(c + d*x))**2*(e + f*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx+e)^2(b\operatorname{arccot}(dx+c)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^2*(b*arccot(d*x + c) + a)^2, x)
```

3.137 $\int (e+fx)\left(a+b\cot^{-1}(c+dx)\right)^2\,dx$

Optimal. Leaf size=220

$$\frac{ib^2(de-cf)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{d^2}+\frac{i(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^2}-\frac{(-cf+de+f)(de-(c+1)f)\left(a+b\cot^{-1}(c\right.}{2d^2f}$$

```
[Out] (a*b*f*x)/d + (b^2*f*(c + d*x)*ArcCot[c + d*x])/d^2 + (I*(d*e - c*f)*(a + b
*ArcCot[c + d*x])^2)/d^2 - ((d*e + f - c*f)*(d*e - (1 + c)*f)*(a + b*ArcCot
[c + d*x])^2)/(2*d^2*f) + ((e + f*x)^2*(a + b*ArcCot[c + d*x])^2)/(2*f) - (
2*b*(d*e - c*f)*(a + b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/d^2 + (b^
2*f*Log[1 + (c + d*x)^2])/(2*d^2) + (I*b^2*(d*e - c*f)*PolyLog[2, 1 - 2/(1
+ I*(c + d*x))])/d^2
```

Rubi [A] time = 0.384159, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {5048, 4865, 4847, 260, 4985, 4885, 4921, 4855, 2402, 2315}

$$\frac{ib^2(de-cf)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{d^2}+\frac{i(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^2}-\frac{(-cf+de+f)(de-(c+1)f)\left(a+b\cot^{-1}(c\right.}{2d^2f}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)*(a + b*ArcCot[c + d*x])^2,x]
```


```
[Out] (a*b*f*x)/d + (b^2*f*(c + d*x)*ArcCot[c + d*x])/d^2 + (I*(d*e - c*f)*(a + b
*ArcCot[c + d*x])^2)/d^2 - ((d*e + f - c*f)*(d*e - (1 + c)*f)*(a + b*ArcCot
[c + d*x])^2)/(2*d^2*f) + ((e + f*x)^2*(a + b*ArcCot[c + d*x])^2)/(2*f) - (
2*b*(d*e - c*f)*(a + b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/d^2 + (b^
2*f*Log[1 + (c + d*x)^2])/(2*d^2) + (I*b^2*(d*e - c*f)*PolyLog[2, 1 - 2/(1
+ I*(c + d*x))])/d^2
```


Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4865

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x])^p)/(e*(q + 1)), x] + D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcCot[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4985

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcCot[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int (e+fx)\left(a+b\cot^{-1}(c+dx)\right)^2\,dx = \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)\left(a+b\cot^{-1}(x)\right)^2\,dx, x, c+dx\right)}{d}$$

$$= \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2f} + \frac{b\,\text{Subst}\left(\int \left(\frac{f^2\left(a+b\cot^{-1}(x)\right)}{d^2} + \frac{((de-f-cf)(de+f-cf)\cdots}{d^2 \cdots}\right.\right.}{f}$$

$$= \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2f} + \frac{b\,\text{Subst}\left(\int \frac{((de-f-cf)(de+f-cf)+2f(de-cf)x)\left(a+b\cot^{-\cdots}\right.}{1+x^2}\right.}{d^2f}$$

$$= \frac{abfx}{d} + \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2f} + \frac{b\,\text{Subst}\left(\int \left(\frac{(de+f-cf)(de-(1+c)f)\left(a+b\cot^{\cdots}\right.}{1+x^2}\right.\right.}{\cdots}$$

$$= \frac{abfx}{d} + \frac{b^2f(c+dx)\cot^{-1}(c+dx)}{d^2} + \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2f} + \frac{\left(b^2f\right)\text{Su}\cdots}{\cdots}$$

$$= \frac{abfx}{d} + \frac{b^2f(c+dx)\cot^{-1}(c+dx)}{d^2} + \frac{i(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^2} - \frac{(de+f-\cdots}{\cdots}$$

$$= \frac{abfx}{d} + \frac{b^2f(c+dx)\cot^{-1}(c+dx)}{d^2} + \frac{i(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^2} - \frac{(de+f-\cdots}{\cdots}$$

$$= \frac{abfx}{d} + \frac{b^2f(c+dx)\cot^{-1}(c+dx)}{d^2} + \frac{i(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^2} - \frac{(de+f-\cdots}{\cdots}$$

$$= \frac{abfx}{d} + \frac{b^2f(c+dx)\cot^{-1}(c+dx)}{d^2} + \frac{i(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^2} - \frac{(de+f-\cdots}{\cdots}$$

Mathematica [A] time = 0.561316, size = 286, normalized size = 1.3

$$2ib^2(de-cf)\text{PolyLog}\left(2,e^{2i\cot^{-1}(c+dx)}\right)-a^2c^2f+2a^2cde+2a^2d^2ex+a^2d^2fx^2+2b\cot^{-1}(c+dx)\Big(-(c+dx)(acf-ad($$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e + f*x)*(a + b*ArcCot[c + d*x])^2,x]
```

```
[Out] (2*a^2*c*d*e + 2*a*b*c*f - a^2*c^2*f + 2*a^2*d^2*e*x + 2*a*b*d*f*x + a^2*d^
2*f*x^2 + b^2*(I + c + d*x)*(-((I + c)*f) + d*(2*e + f*x))*ArcCot[c + d*x]^
2 - 2*a*b*f*ArcTan[c + d*x] + 2*b*ArcCot[c + d*x]*(-((c + d*x)*(-(b*f) + a*
c*f - a*d*(2*e + f*x))) - 2*b*(d*e - c*f)*Log[1 - E^((2*I)*ArcCot[c + d*x])
]) - 4*a*b*d*e*Log[1/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)])] - 2*b^2*f*Log[1/
((c + d*x)*Sqrt[1 + (c + d*x)^(-2)])] + 4*a*b*c*f*Log[1/((c + d*x)*Sqrt[1 +
 (c + d*x)^(-2)])] + (2*I)*b^2*(d*e - c*f)*PolyLog[2, E^((2*I)*ArcCot[c + d
*x])])/(2*d^2)
```

Maple [B] time = 0.135, size = 766, normalized size = 3.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*(a+b*arccot(d*x+c))^2,x)
```

```
[Out] 1/2*I/d^2*b^2*dilog(1/2*I*(d*x+c-I))*c*f+1/4*I/d^2*b^2*ln(d*x+c+I)^2*c*f-1/
2*I/d*b^2*ln(d*x+c-I)*ln(1+(d*x+c)^2)*e-1/2*I/d*b^2*ln(d*x+c+I)*ln(1/2*I*(d
*x+c-I))*e+1/2*I/d*b^2*ln(d*x+c+I)*ln(1+(d*x+c)^2)*e+1/2*I/d*b^2*ln(d*x+c-I
)*ln(-1/2*I*(d*x+c+I))*e-1/d^2*a*b*arccot(d*x+c)*c^2*f-1/d^2*b^2*ln(1+(d*x+
c)^2)*arccot(d*x+c)*c*f-1/d^2*a*b*ln(1+(d*x+c)^2)*c*f-1/4*I/d^2*b^2*ln(d*x+
c-I)^2*c*f-1/2*I/d^2*b^2*dilog(-1/2*I*(d*x+c+I))*c*f+2/d*arccot(d*x+c)*a*b*
c*e+1/2*a^2*x^2*f+a^2*x*e+1/2*b^2*f*ln(1+(d*x+c)^2)/d^2-1/2/d^2*b^2*f*arcta
n(d*x+c)^2+1/2*b^2*arccot(d*x+c)^2*f*x^2+arccot(d*x+c)^2*x*b^2*e-1/2/d^2*a^
2*f*c^2+1/d*a^2*c*e+2*arccot(d*x+c)*x*a*b*e-1/d^2*b^2*arctan(d*x+c)*arccot(
d*x+c)*f+1/d*a*b*ln(1+(d*x+c)^2)*e-1/d^2*a*b*f*arctan(d*x+c)+1/d*b^2*ln(1+(
d*x+c)^2)*arccot(d*x+c)*e+1/d*arccot(d*x+c)^2*b^2*c*e+1/d*b^2*arccot(d*x+c)
*f*x+1/d^2*b^2*arccot(d*x+c)*f*c-1/2/d^2*b^2*arccot(d*x+c)^2*f*c^2-1/4*I/d*
b^2*ln(d*x+c+I)^2*e-1/2*I/d*b^2*dilog(1/2*I*(d*x+c-I))*e+1/4*I/d*b^2*ln(d*x
+c-I)^2*e+1/2*I/d*b^2*dilog(-1/2*I*(d*x+c+I))*e+a*b*arccot(d*x+c)*f*x^2+1/d
```

```
^2*a*b*f*c+1/2*I/d^2*b^2*ln(d*x+c-I)*ln(1+(d*x+c)^2)*c*f+1/2*I/d^2*b^2*ln(d
*x+c+I)*ln(1/2*I*(d*x+c-I))*c*f-1/2*I/d^2*b^2*ln(d*x+c+I)*ln(1+(d*x+c)^2)*c
*f-1/2*I/d^2*b^2*ln(d*x+c-I)*ln(-1/2*I*(d*x+c+I))*c*f+a*b*f*x/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{8}b^2fx^2\arctan(1,dx+c)^2+\frac{1}{4}b^2ex\arctan(1,dx+c)^2+\frac{1}{2}a^2fx^2+\left(x^2\operatorname{arccot}(dx+c)+d\left(\frac{x}{d^2}+\frac{(c^2-1)\arctan\left(\frac{d^2x+c}{d}\right)}{d^3}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/8*b^2*f*x^2*arctan2(1, d*x + c)^2 + 1/4*b^2*e*x*arctan2(1, d*x + c)^2 + 1
/2*a^2*f*x^2 + (x^2*arccot(d*x + c) + d*(x/d^2 + (c^2 - 1)*arctan((d^2*x +
c*d)/d)/d^3 - c*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^3))*a*b*f + a^2*e*x + (2
*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*a*b*e/d - 1/32*(b^2*f*x^
2 + 2*b^2*e*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + integrate(1/16*(12*b^2*
d^2*f*x^3*arctan2(1, d*x + c)^2 + 4*(3*b^2*d^2*e*arctan2(1, d*x + c)^2 + (6
*b^2*c*arctan2(1, d*x + c)^2 + b^2*arctan2(1, d*x + c))*d*f)*x^2 + (b^2*d^2
*f*x^3 + (b^2*d^2*e + 2*b^2*c*d*f)*x^2 + (b^2*c^2 + b^2)*e + (2*b^2*c*d*e +
 (b^2*c^2 + b^2)*f)*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 12*(b^2*c^2*arc
tan2(1, d*x + c)^2 + b^2*arctan2(1, d*x + c)^2)*e + 4*(2*(3*b^2*c*arctan2(1
, d*x + c)^2 + b^2*arctan2(1, d*x + c))*d*e + 3*(b^2*c^2*arctan2(1, d*x + c
)^2 + b^2*arctan2(1, d*x + c)^2)*f)*x + 2*(b^2*d^2*f*x^3 + 2*b^2*c*d*e*x +
(2*b^2*d^2*e + b^2*c*d*f)*x^2)*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/(d^2*x^2 +
 2*c*d*x + c^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(a^2fx+a^2e+\left(b^2fx+b^2e\right)\operatorname{arccot}(dx+c)^2+2\left(abfx+abe\right)\operatorname{arccot}(dx+c),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral(a^2*f*x + a^2*e + (b^2*f*x + b^2*e)*arccot(d*x + c)^2 + 2*(a*b*f*x
 + a*b*e)*arccot(d*x + c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\,\mathrm{acot}\,(c + dx))^2 \left(e + fx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*acot(d*x+c))**2,x)
```

```
[Out] Integral((a + b*acot(c + d*x))**2*(e + f*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx + e\right)(b\,\mathrm{arccot}\,(dx + c) + a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((f*x + e)*(b*arccot(d*x + c) + a)^2, x)
```

3.138 $\int \left(a+b\cot^{-1}(c+dx)\right)^2\,dx$

Optimal. Leaf size=102

$$\frac{ib^2\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{i\left(a+b\cot^{-1}(c+dx)\right)^2}{d}-\frac{2b\log\left(\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d}$$

```
[Out] (I*(a + b*ArcCot[c + d*x])^2)/d + ((c + d*x)*(a + b*ArcCot[c + d*x])^2)/d -
 (2*b*(a + b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/d + (I*b^2*PolyLog[
2, 1 - 2/(1 + I*(c + d*x))])/d
```

Rubi [A] time = 0.116343, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {5040, 4847, 4921, 4855, 2402, 2315}

$$\frac{ib^2\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{i\left(a+b\cot^{-1}(c+dx)\right)^2}{d}-\frac{2b\log\left(\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])^2,x]
```

```
[Out] (I*(a + b*ArcCot[c + d*x])^2)/d + ((c + d*x)*(a + b*ArcCot[c + d*x])^2)/d -
 (2*b*(a + b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/d + (I*b^2*PolyLog[
2, 1 - 2/(1 + I*(c + d*x))])/d
```

Rule 5040

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d},
x] && IGtQ[p, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \left(a+b\cot^{-1}(c+dx)\right)^2\,dx=\frac{\text{Subst}\left(\int \left(a+b\cot^{-1}(x)\right)^2\,dx,x,c+dx\right)}{d}$$

$$=\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{(2b)\,\text{Subst}\left(\int \frac{x\left(a+b\cot^{-1}(x)\right)}{1+x^2}\,dx,x,c+dx\right)}{d}$$

$$=\frac{i\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}-\frac{(2b)\,\text{Subst}\left(\int \frac{a+b\cot^{-1}(x)}{i-x}\,dx\right.}{d}$$

$$=\frac{i\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}-\frac{2b\left(a+b\cot^{-1}(c+dx)\right)\log}{d}$$

$$=\frac{i\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}-\frac{2b\left(a+b\cot^{-1}(c+dx)\right)\log}{d}$$

$$=\frac{i\left(a+b\cot^{-1}(c+dx)\right)^2}{d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d}-\frac{2b\left(a+b\cot^{-1}(c+dx)\right)\log}{d}$$

Mathematica [A] time = 0.161494, size = 118, normalized size = 1.16

$$\frac{ib^2\text{PolyLog}\left(2,e^{2i\cot^{-1}(c+dx)}\right)+a\left(ac+adx-2b\log\left(\frac{1}{(c+dx)\sqrt{\frac{1}{(c+dx)^2}+1}}\right)\right)+2b\cot^{-1}(c+dx)\left(ac+adx-b\log\left(1-e^{2i\cot^{-1}(c}\right.\right.}{d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcCot[c + d*x])^2,x]
```

```
[Out] (b^2*(I + c + d*x)*ArcCot[c + d*x]^2 + 2*b*ArcCot[c + d*x]*(a*c + a*d*x - b
*Log[1 - E^((2*I)*ArcCot[c + d*x])]) + a*(a*c + a*d*x - 2*b*Log[1/((c + d*x
)*Sqrt[1 + (c + d*x)^(-2)])]) + I*b^2*PolyLog[2, E^((2*I)*ArcCot[c + d*x])]
)/d
```

Maple [B] time = 0.143, size = 236, normalized size = 2.3

$$(\operatorname{arccot}(dx+c))^2 xb^2+\frac{i(\operatorname{arccot}(dx+c))^2 b^2}{d}+\frac{(\operatorname{arccot}(dx+c))^2 b^2c}{d}+2\operatorname{arccot}(dx+c)\,xab-2\,\frac{\operatorname{arccot}(dx+c)\,b^2}{d}\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))^2,x)
```

```
[Out] arccot(d*x+c)^2*x*b^2+I/d*arccot(d*x+c)^2*b^2+1/d*arccot(d*x+c)^2*b^2*c+2*a
rccot(d*x+c)*x*a*b-2/d*arccot(d*x+c)*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^
2-2/d*arccot(d*x+c)*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^2+2/d*arccot(d*x+
c)*a*b*c+2*I/d*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^2+2*I/d*polylog(2
,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^2+a^2*x+1/d*a*b*ln(1+(d*x+c)^2)+a^2*c/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{16}\left(4\,x\arctan(1,dx+c)^2-x\log\left(d^2x^2+2\,cdx+c^2+1\right)^2+16\int\frac{12\,d^2x^2\arctan(1,dx+c)^2+12\,c^2\arctan(1,dx+c)^2}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/16*(4*x*arctan2(1, d*x + c)^2 - x*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 16
*integrate(1/16*(12*d^2*x^2*arctan2(1, d*x + c)^2 + 12*c^2*arctan2(1, d*x +
 c)^2 + 8*(3*c*arctan2(1, d*x + c)^2 + arctan2(1, d*x + c))*d*x + (d^2*x^2
+ 2*c*d*x + c^2 + 1)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 12*arctan2(1, d*x
 + c)^2 + 4*(d^2*x^2 + c*d*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/(d^2*x^2 +
2*c*d*x + c^2 + 1), x))*b^2 + a^2*x + (2*(d*x + c)*arccot(d*x + c) + log((d
*x + c)^2 + 1))*a*b/d
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(b^2\operatorname{arccot}(dx+c)^2+2\,ab\operatorname{arccot}(dx+c)+a^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral(b^2*arccot(d*x + c)^2 + 2*a*b*arccot(d*x + c) + a^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a+b\operatorname{acot}(c+dx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))**2,x)
```

```
[Out] Integral((a + b*acot(c + d*x))**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (b\operatorname{arccot}(dx+c)+a)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^2, x)
```

3.139 $\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{e+fx}\,dx$

Optimal. Leaf size=261

$$\frac{ib\left(a+b\cot^{-1}(c+dx)\right)\text{PolyLog}\left(2,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{f}-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{f}+\frac{b^2 \ldots}{}$$

```
[Out] -(((a + b*ArcCot[c + d*x])^2*Log[2/(1 - I*(c + d*x))])/f) + ((a + b*ArcCot[
c + d*x])^2*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f -
 (I*b*(a + b*ArcCot[c + d*x])*PolyLog[2, 1 - 2/(1 - I*(c + d*x))])/f + (I*b
*(a + b*ArcCot[c + d*x])*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*
(1 - I*(c + d*x)))])/f - (b^2*PolyLog[3, 1 - 2/(1 - I*(c + d*x))])/(2*f) +
(b^2*PolyLog[3, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])
/(2*f)
```

Rubi [A] time = 0.176723, antiderivative size = 261, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {5048, 4859}

$$\frac{ib\left(a+b\cot^{-1}(c+dx)\right)\text{PolyLog}\left(2,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{f}-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{f}+\frac{b^2 \ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])^2/(e + f*x),x]
```

```
[Out] -(((a + b*ArcCot[c + d*x])^2*Log[2/(1 - I*(c + d*x))])/f) + ((a + b*ArcCot[
c + d*x])^2*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f -
 (I*b*(a + b*ArcCot[c + d*x])*PolyLog[2, 1 - 2/(1 - I*(c + d*x))])/f + (I*b
*(a + b*ArcCot[c + d*x])*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*
(1 - I*(c + d*x)))])/f - (b^2*PolyLog[3, 1 - 2/(1 - I*(c + d*x))])/(2*f) +
(b^2*PolyLog[3, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])
/(2*f)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
```

```
tQ[p, 0]
```

Rule 4859

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcCot[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcC
ot[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] - Simp[(I*
b*(a + b*ArcCot[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] + Simp[(I*b*(a +
 b*ArcCot[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{e+fx}\,dx = \frac{\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^2}{\frac{de-cf}{d}+\frac{fx}{d}}\,dx, x, c+dx\right)}{d}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2\log\left(\frac{2}{1-i(c+dx)}\right)}{f} + \frac{\left(a+b\cot^{-1}(c+dx)\right)^2\log\left(\frac{2d(e+fx)}{(de+if-cf)(1-i(c+dx))}\right)}{f} -$$

Mathematica [F] time = 6.45206, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{e+fx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcCot[c + d*x])^2/(e + f*x),x]

[Out] Integrate[(a + b*ArcCot[c + d*x])^2/(e + f*x), x]
```

Maple [C] time = 1.504, size = 2201, normalized size = 8.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))^2/(f*x+e),x)
```

```
[Out] b^2*c/(-I*f+c*f-d*e)*arccot(d*x+c)^2*ln(1-(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x
+c+I)^2/(1+(d*x+c)^2))+2*a*b*ln(f*(d*x+c)-c*f+d*e)/f*arccot(d*x+c)-I*a*b/f*
dilog((I*f-f*(d*x+c))/(d*e+I*f-c*f))+2*I*b^2/f*arccot(d*x+c)*polylog(2,(d*x
+c+I)/(1+(d*x+c)^2)^(1/2))-I*b^2/(-I*f+c*f-d*e)*arccot(d*x+c)^2*ln(1-(d*e+I
*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))+2*I*b^2/f*arccot(d*x+c)*p
olylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-I*b^2/f*Pi*arccot(d*x+c)^2-1/2*d*b
^2/f*e/(-I*f+c*f-d*e)*polylog(3,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1
+(d*x+c)^2))+I*a*b*ln(f*(d*x+c)-c*f+d*e)/f*ln((I*f+f*(d*x+c))/(I*f+c*f-d*e)
)+I*b^2/f*Pi*arccot(d*x+c)^2*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x
+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)
^2/(1+(d*x+c)^2)-1))^2-1/2*I*b^2/f*Pi*arccot(d*x+c)^2*csgn(I*(c*f*(d*x+c+I)
^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*
x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1))^3-I*b^2*c/(-I*f+c*f-d*e)*arcc
ot(d*x+c)*polylog(2,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))
-I*a*b*ln(f*(d*x+c)-c*f+d*e)/f*ln((I*f-f*(d*x+c))/(d*e+I*f-c*f))-b^2/f*arcc
ot(d*x+c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-b^2/f*arccot(d*x+c)^2*ln(1-
(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+b^2/f*arccot(d*x+c)^2*ln((d*x+c+I)^2/(1+(d*x
+c)^2)-1)-b^2/(-I*f+c*f-d*e)*arccot(d*x+c)*polylog(2,(d*e+I*f-c*f)/(-c*f+d*
e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-b^2/f*arccot(d*x+c)^2*ln(c*f*(d*x+c+I)^2/
(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c
)^2)*f-I*f)+b^2*ln(f*(d*x+c)-c*f+d*e)/f*arccot(d*x+c)^2+1/2*b^2*c/(-I*f+c*f
-d*e)*polylog(3,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-1/2
*I*b^2/(-I*f+c*f-d*e)*polylog(3,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1
+(d*x+c)^2))+2*I*d*b^2/f*e*arccot(d*x+c)*polylog(2,(d*e+I*f-c*f)/(-c*f+d*e-
I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))/(-2*I*f+2*c*f-2*d*e)+1/2*I*b^2/f*Pi*arccot(
d*x+c)^2*csgn(I/((d*x+c+I)^2/(1+(d*x+c)^2)-1))*csgn(I*(c*f*(d*x+c+I)^2/(1+(
d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)
*f-I*f))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2
)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1))
+I*a*b/f*dilog((I*f+f*(d*x+c))/(I*f+c*f-d*e))+a^2*ln(f*(d*x+c)-c*f+d*e)/f-2
*b^2/f*polylog(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-2*b^2/f*polylog(3,-(d*x+c+I
)/(1+(d*x+c)^2)^(1/2))-1/2*I*b^2/f*Pi*arccot(d*x+c)^2*csgn(I*(c*f*(d*x+c+I)
^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*
x+c)^2)*f-I*f))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d
*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)
^2)-1))^2-d*b^2/f*e/(-I*f+c*f-d*e)*arccot(d*x+c)^2*ln(1-(d*e+I*f-c*f)/(-c*f
+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-1/2*I*b^2/f*Pi*arccot(d*x+c)^2*csgn(I/
((d*x+c+I)^2/(1+(d*x+c)^2)-1))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d
*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+
I)^2/(1+(d*x+c)^2)-1))^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^2 \log\left(fx+e\right)}{f} + \int \frac{12\, b^2 \arctan\left(1, dx+c\right)^2 + b^2 \log\left(d^2x^2 + 2\, cdx + c^2 + 1\right)^2 + 32\, ab \arctan\left(1, dx+c\right)}{16\left(fx+e\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2/(f*x+e),x, algorithm="maxima")
```

```
[Out] a^2*log(f*x + e)/f + integrate(1/16*(12*b^2*arctan2(1, d*x + c)^2 + b^2*log
(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 32*a*b*arctan2(1, d*x + c))/(f*x + e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{b^2 \operatorname{arccot}\left(dx+c\right)^2 + 2\, ab \operatorname{arccot}\left(dx+c\right) + a^2}{fx+e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2/(f*x+e),x, algorithm="fricas")
```

```
[Out] integral((b^2*arccot(d*x + c)^2 + 2*a*b*arccot(d*x + c) + a^2)/(f*x + e), x
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + b \operatorname{acot}\left(c + dx\right)\right)^2}{e + fx}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))**2/(f*x+e),x)
```

```
[Out] Integral((a + b*acot(c + d*x))**2/(e + f*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \operatorname{arccot}(dx + c) + a)^2}{fx + e}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^2/(f*x + e), x)
```

3.140 $\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{(e+fx)^2}\,dx$

Optimal. Leaf size=567

$$\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1-i(c+dx)}\right)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}-\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}+\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}-\frac{2abd\log(e}{(de-cf)^2}$$

```
[Out] (I*b^2*d*ArcCot[c + d*x]^2)/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (b^2*d*
(d*e - c*f)*ArcCot[c + d*x]^2)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)) -
(a + b*ArcCot[c + d*x])^2/(f*(e + f*x)) - (2*a*b*d*(d*e - c*f)*ArcTan[c + d
*x])/(f*(f^2 + (d*e - c*f)^2)) - (2*a*b*d*Log[e + f*x])/(f^2 + (d*e - c*f)^
2) + (2*b^2*d*ArcCot[c + d*x]*Log[2/(1 - I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*
f + (1 + c^2)*f^2) - (2*b^2*d*ArcCot[c + d*x]*Log[(2*d*(e + f*x))/((d*e + I
*f - c*f)*(1 - I*(c + d*x)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) - (2*b
^2*d*ArcCot[c + d*x]*Log[2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 +
c^2)*f^2) + (a*b*d*Log[1 + (c + d*x)^2])/(f^2 + (d*e - c*f)^2) + (I*b^2*d*P
olyLog[2, 1 - 2/(1 - I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) -
 (I*b^2*d*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x
)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (I*b^2*d*PolyLog[2, 1 - 2/(1
+ I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)
```

Rubi [A] time = 1.3864, antiderivative size = 567, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 25, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.25, Rules used = {5046, 1982, 705, 31, 634, 618, 204, 628, 6741, 5058, 706, 635, 203, 260, 6688, 12, 6725, 4857, 2402, 2315, 2447, 4985, 4885, 4921, 4855}

$$\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1-i(c+dx)}\right)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}-\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2d(e+fx)}{(1-i(c+dx))(de+(-c+i)f)}\right)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}+\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)}{\left(c^2+1\right)f^2-2cdef+d^2e^2}-\frac{2abd\log(e}{(de-cf)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])^2/(e + f*x)^2,x]
```

```
[Out] (I*b^2*d*ArcCot[c + d*x]^2)/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (b^2*d*
(d*e - c*f)*ArcCot[c + d*x]^2)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)) -
(a + b*ArcCot[c + d*x])^2/(f*(e + f*x)) - (2*a*b*d*(d*e - c*f)*ArcTan[c + d
*x])/(f*(f^2 + (d*e - c*f)^2)) - (2*a*b*d*Log[e + f*x])/(f^2 + (d*e - c*f)^
2) + (2*b^2*d*ArcCot[c + d*x]*Log[2/(1 - I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*
f + (1 + c^2)*f^2) - (2*b^2*d*ArcCot[c + d*x]*Log[(2*d*(e + f*x))/((d*e + (
```

```
I - c)*f)*(1 - I*(c + d*x)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) - (2*b
^2*d*ArcCot[c + d*x]*Log[2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 +
c^2)*f^2) + (a*b*d*Log[1 + (c + d*x)^2])/(f^2 + (d*e - c*f)^2) + (I*b^2*d*P
olyLog[2, 1 - 2/(1 - I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) -
 (I*b^2*d*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + (I - c)*f)*(1 - I*(c + d*x
)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (I*b^2*d*PolyLog[2, 1 - 2/(1
+ I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)
```

Rule 5046

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
 + d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 1982

```
Int[(u_)^(m_.)*(v_)^(p_.), x_Symbol] :> Int[ExpandToSum[u, x]^m*ExpandToSum
[v, x]^p, x] /; FreeQ[{m, p}, x] && LinearQ[u, x] && QuadraticQ[v, x] &&  !
(LinearMatchQ[u, x] && QuadraticMatchQ[v, x])
```

Rule 705

```
Int[1/(((d_.) + (e_.)*(x_))*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)), x_Symbol]
 :> Dist[e^2/(c*d^2 - b*d*e + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d
^2 - b*d*e + a*e^2), Int[(c*d - b*e - c*e*x)/(a + b*x + c*x^2), x], x] /; F
reeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^
2, 0] && NeQ[2*c*d - b*e, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 6741

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 5058

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)^(q_.), x_Symbol] :> Dist[1/d, Subst
[Int[((d*e - c*f)/d + (f*x)/d)^m*(C/d^2 + (C*x^2)/d^2)^q*(a + b*ArcCot[x])^
p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m, p, q}, x] &&
 EqQ[B*(1 + c^2) - 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 706

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[e^2/(c
*d^2 + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d^2 + a*e^2), Int[(c*d -
 c*e*x)/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2,
 0]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4985

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcCot[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{(e+fx)^2}\,dx = -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2bd)\int \frac{a+b\cot^{-1}(c+dx)}{(e+fx)\left(1+(c+dx)^2\right)}\,dx}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2bd)\int \frac{a+b\cot^{-1}(c+dx)}{(e+fx)\left(1+c^2+2cdx+d^2x^2\right)}\,dx}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2b)\,\text{Subst}\left(\int \frac{a+b\cot^{-1}(x)}{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)(1+x^2)}\,dx, x, c+dx\right)}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2b)\,\text{Subst}\left(\int \frac{d\left(a+b\cot^{-1}(x)\right)}{(de-cf+fx)(1+x^2)}\,dx, x, c+dx\right)}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2bd)\,\text{Subst}\left(\int \frac{a+b\cot^{-1}(x)}{(de-cf+fx)(1+x^2)}\,dx, x, c+dx\right)}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2bd)\,\text{Subst}\left(\int \left(\frac{a}{(de-cf+fx)(1+x^2)} + \frac{b\cot^{-1}(x)}{(de-cf+fx)(1+x^2)}\right) dx, x, c+\right.}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{(2abd)\,\text{Subst}\left(\int \frac{1}{(de-cf+fx)(1+x^2)}\,dx, x, c+dx\right)}{f} - \frac{\left(2b^2d\right)\text{Subs}}{}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{\left(2b^2d\right)\text{Subst}\left(\int \left(\frac{f^2\cot^{-1}(x)}{\left(d^2e^2-2cdef+(1+c^2)f^2\right)(de-cf+fx)} + \frac{(de-cf-f}{\left(d^2e^2-2cdef+(\right.}\right.\right.}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{2abd\log(e+fx)}{f^2+(de-cf)^2} - \frac{\left(2b^2d\right)\text{Subst}\left(\int \frac{(de-cf-fx)\cot^{-1}(x)}{1+x^2}\,dx, x, c\right.}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{2abd(de-cf)\tan^{-1}(c+dx)}{f\left(f^2+(de-cf)^2\right)} - \frac{2abd\log(e+fx)}{f^2+(de-cf)^2} + \frac{2b^2d\cot^{-}}{d^2e^2-}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} - \frac{2abd(de-cf)\tan^{-1}(c+dx)}{f\left(f^2+(de-cf)^2\right)} - \frac{2abd\log(e+fx)}{f^2+(de-cf)^2} + \frac{2b^2d\cot^{-}}{d^2e^2-}$$

$$= \frac{ib^2d\cot^{-1}(c+dx)^2}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{b^2d(de-cf)\cot^{-1}(c+dx)^2}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} - \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} -$$

$$= \frac{ib^2d\cot^{-1}(c+dx)^2}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{b^2d(de-cf)\cot^{-1}(c+dx)^2}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} - \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} -$$

$$= \frac{ib^2d\cot^{-1}(c+dx)^2}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{b^2d(de-cf)\cot^{-1}(c+dx)^2}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} - \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{f(e+fx)} -$$

Mathematica [A] time = 8.94061, size = 454, normalized size = 0.8

$$-\frac{b^2 d\left((c+dx)^2+1\right)(e+fx)\left(\frac{f\left(-i\text{PolyLog}\left(2,\exp\left(2i\left(\tan^{-1}\left(\frac{f}{de-cf}\right)+\cot^{-1}(c+dx)\right)\right)\right)+2\cot^{-1}(c+dx)\log\left(1-\exp\left(2i\left(\tan^{-1}\left(\frac{f}{de-cf}\right)+\cot^{-1}(c+dx)\right)\right)\right)+2\tan^{-1}\left(\frac{f}{cf-de}\right)\left(-\log\left(1-\exp\left(2\cdots\right.\right.\right.\right.}{(c^2+1)f\cdots}\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcCot[c + d*x])^2/(e + f*x)^2,x]
```

```
[Out] -((a^2 + (2*a*b*f*((-(c*d*e) + f + c^2*f - d^2*e*x + c*d*f*x)*ArcCot[c + d*
x] + d*(e + f*x)*Log[-((d*(e + f*x))/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)]))]
))/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (b^2*d*(e + f*x)*(1 + (c + d*x)^
2)*((E^(I*ArcTan[f/(d*e - c*f)])*ArcCot[c + d*x]^2)/((-(d*e) + c*f)*Sqrt[1
+ f^2/(d*e - c*f)^2]) + ArcCot[c + d*x]^2/(d*e + d*f*x) + (f*(I*Pi*ArcCot[c
 + d*x] + Pi*Log[1 + E^((-2*I)*ArcCot[c + d*x])] + 2*ArcCot[c + d*x]*Log[1
- E^((2*I)*(ArcCot[c + d*x] + ArcTan[f/(d*e - c*f)]))] - Pi*Log[1/Sqrt[1 +
(c + d*x)^(-2)]] + 2*ArcTan[f/(-(d*e) + c*f)]*(I*ArcCot[c + d*x] - Log[1 -
E^((2*I)*(ArcCot[c + d*x] + ArcTan[f/(d*e - c*f)]))] + Log[Sin[ArcCot[c + d
*x] + ArcTan[f/(d*e - c*f)]]]) - I*PolyLog[2, E^((2*I)*(ArcCot[c + d*x] + A
rcTan[f/(d*e - c*f)])))]))/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)))/((c + d*x
)^2*(1 + (c + d*x)^(-2))))/(f*(e + f*x)))
```

Maple [B] time = 0.114, size = 1180, normalized size = 2.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))^2/(f*x+e)^2,x)
```

```
[Out] 1/2*I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*dilog(-1/2*I*(d*x+c+I))+d*a*b/(
c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(1+(d*x+c)^2)-2*d*a*b/(c^2*f^2-2*c*d*e*f+d
^2*e^2+f^2)*ln(f*(d*x+c)-c*f+d*e)-d*b^2/(d*f*x+d*e)/f*arccot(d*x+c)^2-2*d*b
^2*arccot(d*x+c)/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(f*(d*x+c)-c*f+d*e)+d*b^
2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)^2*c+I*d*b^2/(c^2*f^2-2*c*d*
e*f+d^2*e^2+f^2)*dilog((I*f-f*(d*x+c))/(d*e+I*f-c*f))-I*d*b^2/(c^2*f^2-2*c*
```

```
d*e*f+d^2*e^2+f^2)*dilog((I*f+f*(d*x+c))/(I*f+c*f-d*e))-1/4*I*d*b^2/(c^2*f^
2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c+I)^2-1/2*I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e
^2+f^2)*dilog(1/2*I*(d*x+c-I))+1/4*I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*
ln(d*x+c-I)^2+d*b^2*arccot(d*x+c)/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(1+(d*x
+c)^2)-2*d^2*a*b/f/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)*e-1/2*I*d*
b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c-I)*ln(1+(d*x+c)^2)+I*d*b^2/(c^
2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(f*(d*x+c)-c*f+d*e)*ln((I*f-f*(d*x+c))/(d*e+
I*f-c*f))+1/2*I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c-I)*ln(-1/2*I
*(d*x+c+I))-I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(f*(d*x+c)-c*f+d*e)*l
n((I*f+f*(d*x+c))/(I*f+c*f-d*e))+2*d*a*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ar
ctan(d*x+c)*c-d^2*b^2/f/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)^2*e-1
/2*I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))+
1/2*I*d*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c+I)*ln(1+(d*x+c)^2)-2*d
^2*b^2/f*arccot(d*x+c)/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)*e-2*d*
a*b/(d*f*x+d*e)/f*arccot(d*x+c)+2*d*b^2*arccot(d*x+c)/(c^2*f^2-2*c*d*e*f+d^
2*e^2+f^2)*arctan(d*x+c)*c-d*a^2/(d*f*x+d*e)/f
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\left(d\left(\frac{2\left(d^2e-cdf\right)\arctan\left(\frac{d^2x+cd}{d}\right)}{\left(d^2e^2f-2\,cdef^2+\left(c^2+1\right)f^3\right)d}-\frac{\log\left(d^2x^2+2\,cdx+c^2+1\right)}{d^2e^2-2\,cdef+\left(c^2+1\right)f^2}+\frac{2\,\log\left(fx+e\right)}{d^2e^2-2\,cdef+\left(c^2+1\right)f^2}\right)+\frac{2\,\mathrm{arccot}\left(dx+c\right)}{f^2x+ef}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] -(d*(2*(d^2*e - c*d*f)*arctan((d^2*x + c*d)/d)/((d^2*e^2*f - 2*c*d*e*f^2 +
(c^2 + 1)*f^3)*d) - log(d^2*x^2 + 2*c*d*x + c^2 + 1)/(d^2*e^2 - 2*c*d*e*f +
 (c^2 + 1)*f^2) + 2*log(f*x + e)/(d^2*e^2 - 2*c*d*e*f + (c^2 + 1)*f^2)) + 2
*arccot(d*x + c)/(f^2*x + e*f))*a*b - 1/16*(4*arctan2(1, d*x + c)^2 - 16*(f
^2*x + e*f)*integrate(1/16*(12*d^2*f*x^2*arctan2(1, d*x + c)^2 + 8*(3*c*arc
tan2(1, d*x + c)^2 - arctan2(1, d*x + c))*d*f*x - 8*d*e*arctan2(1, d*x + c)
 + (d^2*f*x^2 + 2*c*d*f*x + (c^2 + 1)*f)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2
 + 12*(c^2*arctan2(1, d*x + c)^2 + arctan2(1, d*x + c)^2)*f - 4*(d^2*f*x^2
+ c*d*e + (d^2*e + c*d*f)*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1))/(d^2*f^3*x^4
 + (c^2 + 1)*e^2*f + 2*(d^2*e*f^2 + c*d*f^3)*x^3 + (d^2*e^2*f + 4*c*d*e*f^2
 + (c^2 + 1)*f^3)*x^2 + 2*(c*d*e^2*f + (c^2 + 1)*e*f^2)*x), x) - log(d^2*x^
2 + 2*c*d*x + c^2 + 1)^2)*b^2/(f^2*x + e*f) - a^2/(f^2*x + e*f)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\,\mathrm{arccot}\,(dx+c)^2+2\,ab\,\mathrm{arccot}\,(dx+c)+a^2}{f^2x^2+2\,efx+e^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arccot(d*x + c)^2 + 2*a*b*arccot(d*x + c) + a^2)/(f^2*x^2 + 2
*e*f*x + e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))**2/(f*x+e)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\,\mathrm{arccot}\,(dx+c)+a)^2}{(fx+e)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^2/(f*x+e)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^2/(f*x + e)^2, x)
```

3.141 $\int (e+fx)^2 \left(a+b\cot^{-1}(c+dx)\right)^3 \, dx$

Optimal. Leaf size=565

$$\frac{ib^2\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d^3}-\frac{b^3\left(-\left(1-3c^2\right)f^2-6cdef+3d^2\right.}{2d^3}$$

```
[Out] (a*b^2*f^2*x)/d^2 + (b^3*f^2*(c + d*x)*ArcCot[c + d*x])/d^3 + (b*f^2*(a + b
*ArcCot[c + d*x])^2)/(2*d^3) + ((3*I)*b*f*(d*e - c*f)*(a + b*ArcCot[c + d*x
])^2)/d^3 + (3*b*f*(d*e - c*f)*(c + d*x)*(a + b*ArcCot[c + d*x])^2)/d^3 + (
b*f^2*(c + d*x)^2*(a + b*ArcCot[c + d*x])^2)/(2*d^3) + ((I/3)*(3*d^2*e^2 -
6*c*d*e*f - (1 - 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])^3)/d^3 - ((d*e - c*f)*
(d^2*e^2 - 2*c*d*e*f - (3 - c^2)*f^2)*(a + b*ArcCot[c + d*x])^3)/(3*d^3*f)
+ ((e + f*x)^3*(a + b*ArcCot[c + d*x])^3)/(3*f) - (6*b^2*f*(d*e - c*f)*(a +
 b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/d^3 - (b*(3*d^2*e^2 - 6*c*d*e
*f - (1 - 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])^2*Log[2/(1 + I*(c + d*x))])/d
^3 + (b^3*f^2*Log[1 + (c + d*x)^2])/(2*d^3) + ((3*I)*b^3*f*(d*e - c*f)*Poly
Log[2, 1 - 2/(1 + I*(c + d*x))])/d^3 + (I*b^2*(3*d^2*e^2 - 6*c*d*e*f - (1 -
 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/d
^3 - (b^3*(3*d^2*e^2 - 6*c*d*e*f - (1 - 3*c^2)*f^2)*PolyLog[3, 1 - 2/(1 + I
*(c + d*x))])/(2*d^3)
```

Rubi [A] time = 0.963499, antiderivative size = 565, normalized size of antiderivative = 1., number of steps used = 21, number of rules used = 14, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.7, Rules used = {5048, 4865, 4847, 4921, 4855, 2402, 2315, 4853, 4917, 260, 4885, 4985, 4995, 6610}

$$\frac{ib^2\left(-\left(1-3c^2\right)f^2-6cdef+3d^2e^2\right)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d^3}-\frac{b^3\left(-\left(1-3c^2\right)f^2-6cdef+3d^2\right.}{2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^2*(a + b*ArcCot[c + d*x])^3,x]
```


```
[Out] (a*b^2*f^2*x)/d^2 + (b^3*f^2*(c + d*x)*ArcCot[c + d*x])/d^3 + (b*f^2*(a + b
*ArcCot[c + d*x])^2)/(2*d^3) + ((3*I)*b*f*(d*e - c*f)*(a + b*ArcCot[c + d*x
])^2)/d^3 + (3*b*f*(d*e - c*f)*(c + d*x)*(a + b*ArcCot[c + d*x])^2)/d^3 + (
b*f^2*(c + d*x)^2*(a + b*ArcCot[c + d*x])^2)/(2*d^3) + ((I/3)*(3*d^2*e^2 -
6*c*d*e*f - (1 - 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])^3)/d^3 - ((d*e - c*f)*
(d^2*e^2 - 2*c*d*e*f - (3 - c^2)*f^2)*(a + b*ArcCot[c + d*x])^3)/(3*d^3*f)
```

```
+ ((e + f*x)^3*(a + b*ArcCot[c + d*x])^3)/(3*f) - (6*b^2*f*(d*e - c*f)*(a +
 b*ArcCot[c + d*x])*Log[2/(1 + I*(c + d*x))])/d^3 - (b*(3*d^2*e^2 - 6*c*d*e
*f - (1 - 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])^2*Log[2/(1 + I*(c + d*x))])/d
^3 + (b^3*f^2*Log[1 + (c + d*x)^2])/(2*d^3) + ((3*I)*b^3*f*(d*e - c*f)*Poly
Log[2, 1 - 2/(1 + I*(c + d*x))])/d^3 + (I*b^2*(3*d^2*e^2 - 6*c*d*e*f - (1 -
 3*c^2)*f^2)*(a + b*ArcCot[c + d*x])*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/d
^3 - (b^3*(3*d^2*e^2 - 6*c*d*e*f - (1 - 3*c^2)*f^2)*PolyLog[3, 1 - 2/(1 + I
*(c + d*x))])/(2*d^3)
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4865

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x])^p)/(e*(q + 1)), x] + D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcCot[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 4853

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^p)/(d*(m + 1)), x] + Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4917

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcCot[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcCot[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4985

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcCot[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (e+fx)^2 \left(a+b\cot^{-1}(c+dx)\right)^3 dx = \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)^2 \left(a+b\cot^{-1}(x)\right)^3 dx, x, c+dx\right)}{d}$$

$$= \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)^3}{3f} + \frac{b\,\text{Subst}\left(\int \left(\frac{3f^2(de-cf)\left(a+b\cot^{-1}(x)\right)^2}{d^3} + \frac{f^3x(a+b}{d}\right.\right.}{}$$

$$= \frac{(e+fx)^3 \left(a+b\cot^{-1}(c+dx)\right)^3}{3f} + \frac{b\,\text{Subst}\left(\int \frac{\left((de-cf)\left(d^2e^2-2cdef-3f^2+c^2f^2\right)+f\left(3d^2e^2\right.\right.}{1+x^2}\right.}{d^3}$$

$$= \frac{3bf(de-cf)(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^3} + \frac{bf^2(c+dx)^2\left(a+b\cot^{-1}(c+dx\right.}{2d^3}$$

$$= \frac{3ibf(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^3} + \frac{3bf(de-cf)(c+dx)\left(a+b\cot^{-1}(c+d\right.}{d^3}$$

$$= \frac{ab^2f^2x}{d^2} + \frac{bf^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^3} + \frac{3ibf(de-cf)\left(a+b\cot^{-1}(c+dx)\right)^2}{d^3} +$$

$$= \frac{ab^2f^2x}{d^2} + \frac{b^3f^2(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^3} + \frac{3ibf(de-}{}$$

$$= \frac{ab^2f^2x}{d^2} + \frac{b^3f^2(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^3} + \frac{3ibf(de-}{}$$

$$= \frac{ab^2f^2x}{d^2} + \frac{b^3f^2(c+dx)\cot^{-1}(c+dx)}{d^3} + \frac{bf^2\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^3} + \frac{3ibf(de-}{}$$

Mathematica [B] time = 10.4507, size = 2336, normalized size = 4.13

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e + f*x)^2*(a + b*ArcCot[c + d*x])^3,x]
```

```
[Out] (a^2*(a*d^2*e^2 + 3*b*d*e*f - 2*b*c*f^2)*x)/d^2 + (a^2*f*(2*a*d*e + b*f)*x^
2)/(2*d) + (a^3*f^2*x^3)/3 + a^2*b*x*(3*e^2 + 3*e*f*x + f^2*x^2)*ArcCot[c +
```

```
 d*x] + ((-3*a^2*b*c*d^2*e^2 - 3*a^2*b*d*e*f + 3*a^2*b*c^2*d*e*f + 3*a^2*b*
c*f^2 - a^2*b*c^3*f^2)*ArcTan[c + d*x])/d^3 + ((3*a^2*b*d^2*e^2 - 6*a^2*b*c
*d*e*f - a^2*b*f^2 + 3*a^2*b*c^2*f^2)*Log[1 + c^2 + 2*c*d*x + d^2*x^2])/(2*
d^3) + (a*b^2*f^2*x^2*(1 + (c + d*x)^2)*((c + d*x)*(1 - 6*c*ArcCot[c + d*x]
 + 3*ArcCot[c + d*x]^2 + 3*c^2*ArcCot[c + d*x]^2) - (c + d*x)*Sqrt[1 + (c +
 d*x)^(-2)]*(1 - 6*c*ArcCot[c + d*x] - ArcCot[c + d*x]^2 + 3*c^2*ArcCot[c +
 d*x]^2)*Cos[3*ArcCot[c + d*x]] - 2*(-2*ArcCot[c + d*x] + I*ArcCot[c + d*x]
^2 + 6*c*ArcCot[c + d*x]^2 - (3*I)*c^2*ArcCot[c + d*x]^2 + 2*(-1 + 3*c^2)*A
rcCot[c + d*x]*Log[1 - E^((2*I)*ArcCot[c + d*x])] - 6*c*Log[1/((c + d*x)*Sq
rt[1 + (c + d*x)^(-2)])] + Cos[2*ArcCot[c + d*x]]*(I*(-1 + 3*c^2)*ArcCot[c
+ d*x]^2 + (2 - 6*c^2)*ArcCot[c + d*x]*Log[1 - E^((2*I)*ArcCot[c + d*x])] +
 6*c*Log[1/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)])])) + ((4*I)*(-1 + 3*c^2)*Po
lyLog[2, E^((2*I)*ArcCot[c + d*x])])/((c + d*x)^2*(1 + (c + d*x)^(-2)))))/(
4*d*(c + d*x)^2*(1 + (c + d*x)^(-2))*(1/Sqrt[1 + (c + d*x)^(-2)] - c/((c +
d*x)*Sqrt[1 + (c + d*x)^(-2)]))^2) - (3*a*b^2*e^2*(1 + (c + d*x)^2)*(-((c +
 d*x)*ArcCot[c + d*x]^2) + 2*ArcCot[c + d*x]*Log[1 - E^((2*I)*ArcCot[c + d*
x])] - I*(ArcCot[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcCot[c + d*x])])))/(d*(
c + d*x)^2*(1 + (c + d*x)^(-2))) + (6*a*b^2*e*f*(1 + (c + d*x)^2)*(((c + d*
x)*ArcCot[c + d*x])/d^2 - (c*(c + d*x)*ArcCot[c + d*x]^2)/d^2 + ((c + d*x)^
2*(1 + (c + d*x)^(-2))*ArcCot[c + d*x]^2)/(2*d^2) - Log[1/((c + d*x)*Sqrt[1
 + (c + d*x)^(-2)])]/d^2 + (2*c*(ArcCot[c + d*x]*Log[1 - E^((2*I)*ArcCot[c
+ d*x])] - (I/2)*(ArcCot[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcCot[c + d*x])]
)))/d^2))/((c + d*x)^2*(1 + (c + d*x)^(-2))) - (b^3*e^2*(1 + (c + d*x)^2)*(
(-I/8)*Pi^3 + I*ArcCot[c + d*x]^3 - (c + d*x)*ArcCot[c + d*x]^3 + 3*ArcCot[
c + d*x]^2*Log[1 - E^((-2*I)*ArcCot[c + d*x])] + (3*I)*ArcCot[c + d*x]*Poly
Log[2, E^((-2*I)*ArcCot[c + d*x])] + (3*PolyLog[3, E^((-2*I)*ArcCot[c + d*x
])])/2))/(d*(c + d*x)^2*(1 + (c + d*x)^(-2))) + (b^3*e*f*(1 + (c + d*x)^2)*
((-I)*c*Pi^3 + (12*I)*ArcCot[c + d*x]^2 + 12*(c + d*x)*ArcCot[c + d*x]^2 +
(8*I)*c*ArcCot[c + d*x]^3 - 8*c*(c + d*x)*ArcCot[c + d*x]^3 + 4*(c + d*x)^2
*(1 + (c + d*x)^(-2))*ArcCot[c + d*x]^3 + 24*c*ArcCot[c + d*x]^2*Log[1 - E^
((-2*I)*ArcCot[c + d*x])] - 24*ArcCot[c + d*x]*Log[1 - E^((2*I)*ArcCot[c +
d*x])] + (24*I)*c*ArcCot[c + d*x]*PolyLog[2, E^((-2*I)*ArcCot[c + d*x])] +
(12*I)*PolyLog[2, E^((2*I)*ArcCot[c + d*x])] + 12*c*PolyLog[3, E^((-2*I)*Ar
cCot[c + d*x])]))/(4*d^2*(c + d*x)^2*(1 + (c + d*x)^(-2))) - (b^3*f^2*(1 +
(c + d*x)^2)*(I*(-1 + 3*c^2)*ArcCot[c + d*x]*PolyLog[2, E^((-2*I)*ArcCot[c
+ d*x])] + ((c + d*x)^3*(1 + (c + d*x)^(-2))^(3/2)*(((3*I)*Pi^3)/((c + d*x)
*Sqrt[1 + (c + d*x)^(-2)]) - ((9*I)*c^2*Pi^3)/((c + d*x)*Sqrt[1 + (c + d*x)
^(-2)]) - (24*ArcCot[c + d*x])/Sqrt[1 + (c + d*x)^(-2)] + (72*c*ArcCot[c +
d*x]^2)/Sqrt[1 + (c + d*x)^(-2)] - (48*ArcCot[c + d*x]^2)/((c + d*x)*Sqrt[1
 + (c + d*x)^(-2)]) + ((216*I)*c*ArcCot[c + d*x]^2)/((c + d*x)*Sqrt[1 + (c
+ d*x)^(-2)]) - (24*ArcCot[c + d*x]^3)/Sqrt[1 + (c + d*x)^(-2)] - (24*c^2*A
rcCot[c + d*x]^3)/Sqrt[1 + (c + d*x)^(-2)] - ((24*I)*ArcCot[c + d*x]^3)/((c
 + d*x)*Sqrt[1 + (c + d*x)^(-2)]) + (96*c*ArcCot[c + d*x]^3)/((c + d*x)*Sqr
t[1 + (c + d*x)^(-2)]) + ((72*I)*c^2*ArcCot[c + d*x]^3)/((c + d*x)*Sqrt[1 +
 (c + d*x)^(-2)]) + 24*ArcCot[c + d*x]*Cos[3*ArcCot[c + d*x]] - 72*c*ArcCot
```

```
[c + d*x]^2*Cos[3*ArcCot[c + d*x]] - 8*ArcCot[c + d*x]^3*Cos[3*ArcCot[c + d
*x]] + 24*c^2*ArcCot[c + d*x]^3*Cos[3*ArcCot[c + d*x]] - (72*ArcCot[c + d*x
]^2*Log[1 - E^((-2*I)*ArcCot[c + d*x])])/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)
]) + (216*c^2*ArcCot[c + d*x]^2*Log[1 - E^((-2*I)*ArcCot[c + d*x])])/((c +
d*x)*Sqrt[1 + (c + d*x)^(-2)]) - (432*c*ArcCot[c + d*x]*Log[1 - E^((2*I)*Ar
cCot[c + d*x])])/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)]) + (72*Log[1/((c + d*x
)*Sqrt[1 + (c + d*x)^(-2)])])/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)]) + ((288*
I)*c*PolyLog[2, E^((2*I)*ArcCot[c + d*x])])/((c + d*x)^3*(1 + (c + d*x)^(-2
))^(3/2)) + (48*(-1 + 3*c^2)*PolyLog[3, E^((-2*I)*ArcCot[c + d*x])])/((c +
d*x)^3*(1 + (c + d*x)^(-2))^(3/2)) - I*Pi^3*Sin[3*ArcCot[c + d*x]] + (3*I)*
c^2*Pi^3*Sin[3*ArcCot[c + d*x]] - (72*I)*c*ArcCot[c + d*x]^2*Sin[3*ArcCot[c
 + d*x]] + (8*I)*ArcCot[c + d*x]^3*Sin[3*ArcCot[c + d*x]] - (24*I)*c^2*ArcC
ot[c + d*x]^3*Sin[3*ArcCot[c + d*x]] + 24*ArcCot[c + d*x]^2*Log[1 - E^((-2*
I)*ArcCot[c + d*x])]*Sin[3*ArcCot[c + d*x]] - 72*c^2*ArcCot[c + d*x]^2*Log[
1 - E^((-2*I)*ArcCot[c + d*x])]*Sin[3*ArcCot[c + d*x]] + 144*c*ArcCot[c + d
*x]*Log[1 - E^((2*I)*ArcCot[c + d*x])]*Sin[3*ArcCot[c + d*x]] - 24*Log[1/((
c + d*x)*Sqrt[1 + (c + d*x)^(-2)])]*Sin[3*ArcCot[c + d*x]]))/96))/(d^3*(c +
 d*x)^2*(1 + (c + d*x)^(-2)))
```

Maple [B] time = 0.552, size = 3693, normalized size = 6.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^2*(a+b*arccot(d*x+c))^3,x)
```

```
[Out] 1/3*a^3*f^2*x^3+a^3*x*e^2+6/d^2*a*b^2*f*arccot(d*x+c)*e*c-3/d^2*a^2*b*f*ln(
1+(d*x+c)^2)*c*e+3/d^2*a^2*b*f*arctan(d*x+c)*c^2*e-6/d*a*b^2*arccot(d*x+c)*
arctan(d*x+c)*c*e^2+3/d^2*a*b^2*f*arctan(d*x+c)^2*c^2*e+6/d^2*b^3*f*c*e*arc
cot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-1/2*I/d^3*a*b^2*ln(d*x+c-I
)*ln(-1/2*I*(d*x+c+I))*f^2-1/2*I/d^3*a*b^2*ln(1+(d*x+c)^2)*ln(d*x+c+I)*f^2+
1/2*I/d^3*a*b^2*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))*f^2+1/2*I/d^3*a*b^2*ln(1+(d
*x+c)^2)*ln(d*x+c-I)*f^2+6*I/d^3*b^3*f^2*c^2*arccot(d*x+c)*polylog(2,(d*x+c
+I)/(1+(d*x+c)^2)^(1/2))+3/2*I/d^3*a*b^2*dilog(-1/2*I*(d*x+c+I))*c^2*f^2+6*
I/d^3*b^3*f^2*c^2*arccot(d*x+c)*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3
/4*I/d^3*a*b^2*ln(d*x+c+I)^2*c^2*f^2+a*b^2*f^2*x/d^2+3/2/d^3*a^2*b*f^2*ln(1
+(d*x+c)^2)*c^2+3/d^2*a*b^2*f*ln(1+(d*x+c)^2)*e-3/d^2*a*b^2*f*arctan(d*x+c)
^2*e-3*I/d^3*b^3*f^2*arccot(d*x+c)^2*c+3/4*I/d*a*b^2*ln(d*x+c-I)^2*e^2+3/2*
I/d*a*b^2*dilog(-1/2*I*(d*x+c+I))*e^2-3/4*I/d*a*b^2*ln(d*x+c+I)^2*e^2+3*I/d
^2*b^3*f*arccot(d*x+c)^2*e-1/2*I/d^3*a*b^2*dilog(-1/2*I*(d*x+c+I))*f^2-1/4*
I/d^3*a*b^2*ln(d*x+c-I)^2*f^2+6*I/d^2*b^3*f*e*polylog(2,-(d*x+c+I)/(1+(d*x+
```

c)^2)^(1/2))+6*I/d^2*b^3*f*e*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6*I/d
^3*b^3*f^2*c*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3*a^2*b*f*arccot(d*x+
c)*e*x^2+3*a*b^2*f*arccot(d*x+c)^2*e*x^2-3/d*a^2*b*arctan(d*x+c)*c*e^2-3/d*
a*b^2*arctan(d*x+c)^2*c*e^2+3/2/d*e^2*a^2*b*ln(1+(d*x+c)^2)+1/d^3*a*b^2*f^2
*c-5/2/d^3*a^2*b*f^2*c^2-6/d^2*a*b^2*f*arccot(d*x+c)*ln(1+(d*x+c)^2)*c*e+6/
d^2*a*b^2*f*arccot(d*x+c)*arctan(d*x+c)*c^2*e+3*I/d^2*a*b^2*dilog(1/2*I*(d*
x+c-I))*c*e*f-3/2*I/d^3*a*b^2*ln(1+(d*x+c)^2)*ln(d*x+c-I)*c^2*f^2-12*I/d^2*
b^3*f*c*e*arccot(d*x+c)*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-12*I/d^2*
b^3*f*c*e*arccot(d*x+c)*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3/2*I/d^3*
a*b^2*ln(d*x+c-I)*ln(-1/2*I*(d*x+c+I))*c^2*f^2-3/2*I/d^2*a*b^2*ln(d*x+c-I)^
2*c*e*f+1/3*a^3/f*e^3+a^3*f*x^2*e+3/2*I/d^2*a*b^2*ln(d*x+c+I)^2*c*e*f-3*I/d
^2*a*b^2*dilog(-1/2*I*(d*x+c+I))*c*e*f+3/2*I/d^3*a*b^2*ln(1+(d*x+c)^2)*ln(d
*x+c+I)*c^2*f^2-3/2*I/d^3*a*b^2*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))*c^2*f^2+1/d
^3*b^3*f^2*arccot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+1/d^3*b^3*f^
2*arccot(d*x+c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-5/2/d^3*b^3*f^2*arcco
t(d*x+c)^2*c^2+1/3/d^3*b^3*f^2*arccot(d*x+c)^3*c^3+1/2/d*b^3*f^2*arccot(d*x
+c)^2*x^2+1/d^2*b^3*f^2*arccot(d*x+c)*x+1/d^3*b^3*f^2*arccot(d*x+c)*c-1/2/d
^3*a^2*b*f^2*ln(1+(d*x+c)^2)+a*b^2/f*arccot(d*x+c)^2*e^3-1/d^3*a*b^2*f^2*ar
ctan(d*x+c)+1/d^2*b^3*f*arccot(d*x+c)^3*e-1/d^3*b^3*f^2*arccot(d*x+c)^3*c+b
^3*f*arccot(d*x+c)^3*e*x^2+a^2*b*f^2*arccot(d*x+c)*x^3+3*arccot(d*x+c)*x*a^
2*b*e^2+3*arccot(d*x+c)^2*x*a*b^2*e^2+a*b^2*f^2*arccot(d*x+c)^2*x^3+a^2*b/f
*arctan(d*x+c)*e^3+a^2*b/f*arccot(d*x+c)*e^3+a*b^2/f*arctan(d*x+c)^2*e^3-1/
3*I/d^3*b^3*f^2*arccot(d*x+c)^3-I/d^3*b^3*f^2*arccot(d*x+c)+1/3*b^3*f^2*arc
cot(d*x+c)^3*x^3+arccot(d*x+c)^3*x*b^3*e^2-6/d*b^3*e^2*polylog(3,(d*x+c+I)/
(1+(d*x+c)^2)^(1/2))-6/d*b^3*e^2*polylog(3,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+
2/d^3*b^3*f^2*polylog(3,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+2/d^3*b^3*f^2*polyl
og(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+1/2/d^3*b^3*f^2*arccot(d*x+c)^2-1/d^3*b
^3*f^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-1/d^3*b^3*f^2*ln((d*x+c+I)/(1+(d
*x+c)^2)^(1/2)-1)+2/d^3*b^3*f^2*ln((d*x+c+I)/(1+(d*x+c)^2)^(1/2))-2*a^2*b/d
^2*x*c*f^2+3*a^2*b/d*x*e*f+2*a*b^2/f*arccot(d*x+c)*arctan(d*x+c)*e^3-6/d^2*
b^3*f*e*arccot(d*x+c)*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3/d^3*a*b^2*f^2*a
rctan(d*x+c)^2*c-3/2*I/d*a*b^2*dilog(1/2*I*(d*x+c-I))*e^2+6*I/d*b^3*e^2*arc
cot(d*x+c)*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6/d^3*b^3*f^2*c^2*polyl
og(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6/d^3*b^3*f^2*c^2*polylog(3,-(d*x+c+I)/
(1+(d*x+c)^2)^(1/2))-3/d*b^3*e^2*arccot(d*x+c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^
2)^(1/2))-3/d*b^3*e^2*arccot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+1
/d*arccot(d*x+c)^3*b^3*c*e^2+I/d*b^3*arccot(d*x+c)^3*e^2-1/d^3*a^2*b*f^2*ar
ctan(d*x+c)*c^3+12/d^2*b^3*f*c*e*polylog(3,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+
12/d^2*b^3*f*c*e*polylog(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-1/d^2*b^3*f*arcco
t(d*x+c)^3*c^2*e-5/d^3*a*b^2*f^2*arccot(d*x+c)*c^2-2/d^2*b^3*f^2*arccot(d*x
+c)^2*c*x+3/d*b^3*f*arccot(d*x+c)^2*e*x+3/d^2*b^3*f*arccot(d*x+c)^2*e*c+6/d
^3*b^3*f^2*c*arccot(d*x+c)*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+6/d^3*b^3*f^
2*c*arccot(d*x+c)*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/d^3*b^3*f^2*c^2*arc
cot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/d^3*b^3*f^2*c^2*arccot(d
*x+c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6/d^2*b^3*f*e*arccot(d*x+c)*ln(

```
1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-1/d^3*a*b^2*f^2*arccot(d*x+c)*ln(1+(d*x+c)
^2)+1/d*a*b^2*f^2*arccot(d*x+c)*x^2+1/2/d*a^2*b*f^2*x^2+6*I/d*b^3*e^2*arcco
t(d*x+c)*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+1/2*I/d^3*a*b^2*dilog(1/
2*I*(d*x+c-I))*f^2-2*I/d^3*b^3*f^2*arccot(d*x+c)*polylog(2,-(d*x+c+I)/(1+(d
*x+c)^2)^(1/2))-2*I/d^3*b^3*f^2*arccot(d*x+c)*polylog(2,(d*x+c+I)/(1+(d*x+c
)^2)^(1/2))-6*I/d^3*b^3*f^2*c*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+1/4
*I/d^3*a*b^2*ln(d*x+c+I)^2*f^2-1/d^3*a*b^2*f^2*arctan(d*x+c)^2*c^3+I/d^3*b^
3*f^2*arccot(d*x+c)^3*c^2+3/d*a*b^2*arccot(d*x+c)*ln(1+(d*x+c)^2)*e^2+3/d^3
*a^2*b*f^2*arctan(d*x+c)*c-3/d^2*a^2*b*f*arctan(d*x+c)*e-3/d^3*a*b^2*f^2*ln
(1+(d*x+c)^2)*c-3*I/d^2*a*b^2*ln(1+(d*x+c)^2)*ln(d*x+c+I)*c*e*f-3*I/d^2*a*b
^2*ln(d*x+c-I)*ln(-1/2*I*(d*x+c+I))*c*e*f+3*I/d^2*a*b^2*ln(d*x+c+I)*ln(1/2*
I*(d*x+c-I))*c*e*f+3*I/d^2*a*b^2*ln(1+(d*x+c)^2)*ln(d*x+c-I)*c*e*f-2*I/d^2*
b^3*f*arccot(d*x+c)^3*c*e+3/4*I/d^3*a*b^2*ln(d*x+c-I)^2*c^2*f^2-3/2*I/d*a*b
^2*ln(1+(d*x+c)^2)*ln(d*x+c-I)*e^2+3/2*I/d*a*b^2*ln(d*x+c-I)*ln(-1/2*I*(d*x
+c+I))*e^2+3/2*I/d*a*b^2*ln(1+(d*x+c)^2)*ln(d*x+c+I)*e^2-3/2*I/d*a*b^2*ln(d
*x+c+I)*ln(1/2*I*(d*x+c-I))*e^2-3/2*I/d^3*a*b^2*dilog(1/2*I*(d*x+c-I))*c^2*
f^2-6/d^2*a*b^2*f*arccot(d*x+c)*arctan(d*x+c)*e+6/d^2*b^3*f*c*e*arccot(d*x+
c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3/d^3*a*b^2*f^2*arccot(d*x+c)*ln(1
+(d*x+c)^2)*c^2-4/d^2*a*b^2*f^2*arccot(d*x+c)*c*x-2/d^3*a*b^2*f^2*arccot(d*
x+c)*arctan(d*x+c)*c^3+6/d^3*a*b^2*f^2*arccot(d*x+c)*arctan(d*x+c)*c+6/d*a*
b^2*f*arccot(d*x+c)*e*x+3/d^2*a^2*b*f*c*e
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/24*b^3*f^2*x^3*arctan2(1, d*x + c)^3 + 1/8*b^3*e*f*x^2*arctan2(1, d*x + c
)^3 + 1/8*b^3*e^2*x*arctan2(1, d*x + c)^3 + 1/3*a^3*f^2*x^3 + a^3*e*f*x^2 +
 3*(x^2*arccot(d*x + c) + d*(x/d^2 + (c^2 - 1)*arctan((d^2*x + c*d)/d)/d^3
- c*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^3))*a^2*b*e*f + 1/2*(2*x^3*arccot(d*
x + c) + d*((d*x^2 - 4*c*x)/d^3 - 2*(c^3 - 3*c)*arctan((d^2*x + c*d)/d)/d^4
 + (3*c^2 - 1)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^4))*a^2*b*f^2 + a^3*e^2*x
 + 3/2*(2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*a^2*b*e^2/d - 1
/32*(b^3*f^2*x^3*arctan2(1, d*x + c) + 3*b^3*e*f*x^2*arctan2(1, d*x + c) +
3*b^3*e^2*x*arctan2(1, d*x + c))*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + integ
rate(1/32*(4*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)
*d^2*f^2*x^4 + 4*(2*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x
+ c)^2)*d^2*e*f + (b^3*arctan2(1, d*x + c)^2 + 2*(7*b^3*arctan2(1, d*x + c)
```

```
^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*f^2)*x^3 + 4*(7*b^3*arctan2(1, d*
x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2 + (7*b^3*arctan2(1, d*x + c)^3 +
24*a*b^2*arctan2(1, d*x + c)^2)*c^2)*e^2 + 4*((7*b^3*arctan2(1, d*x + c)^3
+ 24*a*b^2*arctan2(1, d*x + c)^2)*d^2*e^2 + (3*b^3*arctan2(1, d*x + c)^2 +
4*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*e*f +
 (7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2 + (7*b^3*arc
tan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c^2)*f^2)*x^2 + (3*b^3
*d^2*f^2*x^4*arctan2(1, d*x + c) + (6*b^3*d^2*e*f*arctan2(1, d*x + c) + (6*
b^3*c*arctan2(1, d*x + c) - b^3)*d*f^2)*x^3 + 3*(b^3*c^2*arctan2(1, d*x + c
) + b^3*arctan2(1, d*x + c))*e^2 + 3*(b^3*d^2*e^2*arctan2(1, d*x + c) + (4*
b^3*c*arctan2(1, d*x + c) - b^3)*d*e*f + (b^3*c^2*arctan2(1, d*x + c) + b^3
*arctan2(1, d*x + c))*f^2)*x^2 + 3*((2*b^3*c*arctan2(1, d*x + c) - b^3)*d*e
^2 + 2*(b^3*c^2*arctan2(1, d*x + c) + b^3*arctan2(1, d*x + c))*e*f)*x)*log(
d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 4*((3*b^3*arctan2(1, d*x + c)^2 + 2*(7*b^3
*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*e^2 + 2*(7*b^
3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2 + (7*b^3*arctan2(1
, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c^2)*e*f)*x + 4*(b^3*d^2*f^2
*x^4*arctan2(1, d*x + c) + 3*b^3*c*d*e^2*x*arctan2(1, d*x + c) + (3*b^3*d^2
*e*f*arctan2(1, d*x + c) + b^3*c*d*f^2*arctan2(1, d*x + c))*x^3 + 3*(b^3*d^
2*e^2*arctan2(1, d*x + c) + b^3*c*d*e*f*arctan2(1, d*x + c))*x^2)*log(d^2*x
^2 + 2*c*d*x + c^2 + 1))/(d^2*x^2 + 2*c*d*x + c^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

integral $\left(a^3f^2x^2 + 2\,a^3efx + a^3e^2 + \left(b^3f^2x^2 + 2\,b^3efx + b^3e^2\right)\operatorname{arccot}(dx+c)^3 + 3\left(ab^2f^2x^2 + 2\,ab^2efx + ab^2e^2\right)\operatorname{arccot}\right.$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(a^3*f^2*x^2 + 2*a^3*e*f*x + a^3*e^2 + (b^3*f^2*x^2 + 2*b^3*e*f*x +
 b^3*e^2)*arccot(d*x + c)^3 + 3*(a*b^2*f^2*x^2 + 2*a*b^2*e*f*x + a*b^2*e^2)
*arccot(d*x + c)^2 + 3*(a^2*b*f^2*x^2 + 2*a^2*b*e*f*x + a^2*b*e^2)*arccot(d
*x + c), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\operatorname{acot}(c + dx))^3 \left(e + fx\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*(a+b*acot(d*x+c))**3,x)
```

```
[Out] Integral((a + b*acot(c + d*x))**3*(e + f*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx+e)^2 (b \operatorname{arccot}(dx+c)+a)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*(a+b*arccot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^2*(b*arccot(d*x + c) + a)^3, x)
```

3.142 $\int (e+fx)\left(a+b\cot^{-1}(c+dx)\right)^3\,dx$

Optimal. Leaf size=337

$$\frac{3ib^2(de-cf)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d^2}-\frac{3b^3(de-cf)\text{PolyLog}\left(3,1-\frac{2}{1+i(c+dx)}\right)}{2d^2}+\frac{3ib^3f\text{PolyLog}}{2}$$

```
[Out] (((3*I)/2)*b*f*(a + b*ArcCot[c + d*x])^2)/d^2 + (3*b*f*(c + d*x)*(a + b*Arc
Cot[c + d*x])^2)/(2*d^2) + (I*(d*e - c*f)*(a + b*ArcCot[c + d*x])^3)/d^2 -
((d*e + f - c*f)*(d*e - (1 + c)*f)*(a + b*ArcCot[c + d*x])^3)/(2*d^2*f) + (
(e + f*x)^2*(a + b*ArcCot[c + d*x])^3)/(2*f) - (3*b^2*f*(a + b*ArcCot[c + d
*x])*Log[2/(1 + I*(c + d*x))])/d^2 - (3*b*(d*e - c*f)*(a + b*ArcCot[c + d*x
])^2*Log[2/(1 + I*(c + d*x))])/d^2 + (((3*I)/2)*b^3*f*PolyLog[2, 1 - 2/(1 +
 I*(c + d*x))])/d^2 + ((3*I)*b^2*(d*e - c*f)*(a + b*ArcCot[c + d*x])*PolyLo
g[2, 1 - 2/(1 + I*(c + d*x))])/d^2 - (3*b^3*(d*e - c*f)*PolyLog[3, 1 - 2/(1
 + I*(c + d*x))])/(2*d^2)
```

Rubi [A] time = 0.66385, antiderivative size = 337, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 11, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.611, Rules used = {5048, 4865, 4847, 4921, 4855, 2402, 2315, 4985, 4885, 4995, 6610}

$$\frac{3ib^2(de-cf)\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d^2}-\frac{3b^3(de-cf)\text{PolyLog}\left(3,1-\frac{2}{1+i(c+dx)}\right)}{2d^2}+\frac{3ib^3f\text{PolyLog}}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)*(a + b*ArcCot[c + d*x])^3,x]
```


```
[Out] (((3*I)/2)*b*f*(a + b*ArcCot[c + d*x])^2)/d^2 + (3*b*f*(c + d*x)*(a + b*Arc
Cot[c + d*x])^2)/(2*d^2) + (I*(d*e - c*f)*(a + b*ArcCot[c + d*x])^3)/d^2 -
((d*e + f - c*f)*(d*e - (1 + c)*f)*(a + b*ArcCot[c + d*x])^3)/(2*d^2*f) + (
(e + f*x)^2*(a + b*ArcCot[c + d*x])^3)/(2*f) - (3*b^2*f*(a + b*ArcCot[c + d
*x])*Log[2/(1 + I*(c + d*x))])/d^2 - (3*b*(d*e - c*f)*(a + b*ArcCot[c + d*x
])^2*Log[2/(1 + I*(c + d*x))])/d^2 + (((3*I)/2)*b^3*f*PolyLog[2, 1 - 2/(1 +
 I*(c + d*x))])/d^2 + ((3*I)*b^2*(d*e - c*f)*(a + b*ArcCot[c + d*x])*PolyLo
g[2, 1 - 2/(1 + I*(c + d*x))])/d^2 - (3*b^3*(d*e - c*f)*PolyLog[3, 1 - 2/(1
 + I*(c + d*x))])/(2*d^2)
```


Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4865

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x])^p)/(e*(q + 1)), x] + D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcCot[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 4985

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcCot[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (e+fx)\left(a+b\cot^{-1}(c+dx)\right)^3\,dx = \frac{\text{Subst}\left(\int\left(\frac{de-cf}{d}+\frac{fx}{d}\right)\left(a+b\cot^{-1}(x)\right)^3\,dx,x,c+dx\right)}{d}$$

$$= \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^3}{2f} + \frac{(3b)\,\text{Subst}\left(\int\left(\frac{f^2\left(a+b\cot^{-1}(x)\right)^2}{d^2}+\frac{((de-f-cf)(de+}{}\right.\right.}{2f}$$

$$= \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^3}{2f} + \frac{(3b)\,\text{Subst}\left(\int\frac{((de-f-cf)(de+f-cf)+2f(de-cf)x)\left(a+\right.}{1+x^2}\right.}{2d^2f}$$

$$= \frac{3bf(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{(e+fx)^2\left(a+b\cot^{-1}(c+dx)\right)^3}{2f} + \frac{(3b)\,\text{Su}}{}$$

$$= \frac{3ibf\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{3bf(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{(e+fx)^2\left(a\right.}{}$$

$$= \frac{3ibf\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{3bf(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{i(de-cf)\left(a\right.}{}$$

$$= \frac{3ibf\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{3bf(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{i(de-cf)\left(a\right.}{}$$

$$= \frac{3ibf\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{3bf(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{i(de-cf)\left(a\right.}{}$$

$$= \frac{3ibf\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{3bf(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^2}{2d^2} + \frac{i(de-cf)\left(a\right.}{}$$

Mathematica [A] time = 1.22149, size = 630, normalized size = 1.87

$$6ab^2de\left(i\text{PolyLog}\left(2,e^{2i\cot^{-1}(c+dx)}\right)+\cot^{-1}(c+dx)\left((c+dx+i)\cot^{-1}(c+dx)-2\log\left(1-e^{2i\cot^{-1}(c+dx)}\right)\right)\right)-6ab^2cf\left(i\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e + f*x)*(a + b*ArcCot[c + d*x])^3,x]
```

```
[Out] (a^2*(2*a*d*e + 3*b*f - 2*a*c*f)*(c + d*x) + a^3*f*(c + d*x)^2 - 3*a^2*b*(c
 + d*x)*(c*f - d*(2*e + f*x))*ArcCot[c + d*x] - 3*a^2*b*f*ArcTan[c + d*x] +
 6*a*b^2*f*((c + d*x)*ArcCot[c + d*x] + ((1 + (c + d*x)^2)*ArcCot[c + d*x]^
2)/2 - Log[1/((c + d*x)*Sqrt[1 + (c + d*x)^(-2)])]) + 3*a^2*b*(d*e - c*f)*L
og[1 + (c + d*x)^2] + 6*a*b^2*d*e*(ArcCot[c + d*x]*((I + c + d*x)*ArcCot[c
+ d*x] - 2*Log[1 - E^((2*I)*ArcCot[c + d*x])]) + I*PolyLog[2, E^((2*I)*ArcC
ot[c + d*x])]) - 6*a*b^2*c*f*(ArcCot[c + d*x]*((I + c + d*x)*ArcCot[c + d*x
] - 2*Log[1 - E^((2*I)*ArcCot[c + d*x])]) + I*PolyLog[2, E^((2*I)*ArcCot[c
+ d*x])]) + b^3*f*(3*(c + d*x)*ArcCot[c + d*x]^2 + (1 + (c + d*x)^2)*ArcCot
[c + d*x]^3 - 6*ArcCot[c + d*x]*Log[1 - E^((2*I)*ArcCot[c + d*x])] + (3*I)*
(ArcCot[c + d*x]^2 + PolyLog[2, E^((2*I)*ArcCot[c + d*x])])) + 2*b^3*d*e*((
I/8)*Pi^3 - I*ArcCot[c + d*x]^3 + (c + d*x)*ArcCot[c + d*x]^3 - 3*ArcCot[c
+ d*x]^2*Log[1 - E^((-2*I)*ArcCot[c + d*x])] - (3*I)*ArcCot[c + d*x]*PolyLo
g[2, E^((-2*I)*ArcCot[c + d*x])] - (3*PolyLog[3, E^((-2*I)*ArcCot[c + d*x])
])/2) - 2*b^3*c*f*((I/8)*Pi^3 - I*ArcCot[c + d*x]^3 + (c + d*x)*ArcCot[c +
d*x]^3 - 3*ArcCot[c + d*x]^2*Log[1 - E^((-2*I)*ArcCot[c + d*x])] - (3*I)*Ar
cCot[c + d*x]*PolyLog[2, E^((-2*I)*ArcCot[c + d*x])] - (3*PolyLog[3, E^((-2
*I)*ArcCot[c + d*x])])/2))/(2*d^2)
```

Maple [B] time = 0.517, size = 1570, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*(a+b*arccot(d*x+c))^3,x)
```

```
[Out] 6/d^2*b^3*c*f*polylog(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+6/d^2*b^3*c*f*polylo
g(3,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/d*b^3*e*arccot(d*x+c)^2*ln(1+(d*x+c+I
)/(1+(d*x+c)^2)^(1/2))-3/d*b^3*e*arccot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^
2)^(1/2))+1/d*arccot(d*x+c)^3*b^3*c*e-3/2/d^2*a^2*b*f*arctan(d*x+c)+3*I/d^2
*b^3*f*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3/2*I/d^2*b^3*f*arccot(d*x+
c)^2+3*I/d^2*b^3*f*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3/2*a*b^2*arcc
ot(d*x+c)^2*f*x^2+I/d*b^3*arccot(d*x+c)^3*e+3/2/d*a^2*b*ln(1+(d*x+c)^2)*e+3
/2/d^2*a*b^2*f*ln(1+(d*x+c)^2)-3/2*I/d^2*a*b^2*ln(d*x+c+I)*ln(1+(d*x+c)^2)*
c*f-3/2*I/d^2*a*b^2*ln(d*x+c-I)*ln(-1/2*I*(d*x+c+I))*c*f+3/2*I/d^2*a*b^2*ln
(d*x+c-I)*ln(1+(d*x+c)^2)*c*f+3/2*I/d^2*a*b^2*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I
))*c*f-3/4*I/d*a*b^2*ln(d*x+c+I)^2*e-3/2*I/d*a*b^2*dilog(1/2*I*(d*x+c-I))*e
+3/d*a*b^2*arccot(d*x+c)*f*x+3/d^2*a*b^2*arccot(d*x+c)*f*c+3/d*arccot(d*x+c
)*a^2*b*c*e+3/d*arccot(d*x+c)^2*a*b^2*c*e-3/2/d^2*a*b^2*arccot(d*x+c)^2*c^2
*f-3/2/d^2*a^2*b*arccot(d*x+c)*c^2*f-3/2/d^2*a^2*b*ln(1+(d*x+c)^2)*c*f+3/d^
2*b^3*c*f*arccot(d*x+c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3/d^2*b^3*c*f
```

```
*arccot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/d^2*a*b^2*arctan(d*x
+c)*arccot(d*x+c)*f+3/2/d^2*a^2*b*c*f+3/d*a*b^2*ln(1+(d*x+c)^2)*arccot(d*x+
c)*e+6*I/d*b^3*e*arccot(d*x+c)*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+6*
I/d*b^3*e*arccot(d*x+c)*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-I/d^2*b^3*
arccot(d*x+c)^3*c*f+3/4*I/d*a*b^2*ln(d*x+c-I)^2*e+3/2*I/d*a*b^2*dilog(-1/2*
I*(d*x+c+I))*e+1/2*a^3*x^2*f+a^3*x*e-3/2/d^2*a*b^2*f*arctan(d*x+c)^2-3/d^2*
b^3*f*arccot(d*x+c)*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/d^2*b^3*f*arccot(
d*x+c)*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-1/2/d^2*b^3*arccot(d*x+c)^3*c^2*
f+3/2/d*b^3*arccot(d*x+c)^2*f*x+3*arccot(d*x+c)*x*a^2*b*e+3*arccot(d*x+c)^2
*x*a*b^2*e+3/2*a^2*b*arccot(d*x+c)*f*x^2+3/2*a^2*b/d*f*x+3/2*I/d*a*b^2*ln(d
*x+c-I)*ln(-1/2*I*(d*x+c+I))*e-3/d^2*a*b^2*ln(1+(d*x+c)^2)*arccot(d*x+c)*c*
f-6*I/d^2*b^3*c*f*arccot(d*x+c)*polylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6*
I/d^2*b^3*c*f*arccot(d*x+c)*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/4*I
/d^2*a*b^2*ln(d*x+c-I)^2*c*f-3/2*I/d^2*a*b^2*dilog(-1/2*I*(d*x+c+I))*c*f+3/
4*I/d^2*a*b^2*ln(d*x+c+I)^2*c*f+3/2*I/d^2*a*b^2*dilog(1/2*I*(d*x+c-I))*c*f-
3/2*I/d*a*b^2*ln(d*x+c-I)*ln(1+(d*x+c)^2)*e-3/2*I/d*a*b^2*ln(d*x+c+I)*ln(1/
2*I*(d*x+c-I))*e+3/2*I/d*a*b^2*ln(d*x+c+I)*ln(1+(d*x+c)^2)*e-1/2/d^2*a^3*f*
c^2+1/d*a^3*c*e+1/2*b^3*arccot(d*x+c)^3*f*x^2+arccot(d*x+c)^3*x*b^3*e-6/d*b
^3*e*polylog(3,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6/d*b^3*e*polylog(3,(d*x+c+I
)/(1+(d*x+c)^2)^(1/2))+1/2/d^2*b^3*arccot(d*x+c)^3*f+3/2/d^2*b^3*arccot(d*x
+c)^2*f*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/16*b^3*f*x^2*arctan2(1, d*x + c)^3 + 1/8*b^3*e*x*arctan2(1, d*x + c)^3 +
1/2*a^3*f*x^2 + 3/2*(x^2*arccot(d*x + c) + d*(x/d^2 + (c^2 - 1)*arctan((d^2
*x + c*d)/d)/d^3 - c*log(d^2*x^2 + 2*c*d*x + c^2 + 1)/d^3))*a^2*b*f + a^3*e
*x + 3/2*(2*(d*x + c)*arccot(d*x + c) + log((d*x + c)^2 + 1))*a^2*b*e/d - 3
/64*(b^3*f*x^2*arctan2(1, d*x + c) + 2*b^3*e*x*arctan2(1, d*x + c))*log(d^2
*x^2 + 2*c*d*x + c^2 + 1)^2 + integrate(1/64*(8*(7*b^3*arctan2(1, d*x + c)^
3 + 24*a*b^2*arctan2(1, d*x + c)^2)*d^2*f*x^3 + 4*(2*(7*b^3*arctan2(1, d*x
+ c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*d^2*e + (3*b^3*arctan2(1, d*x + c)
^2 + 4*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*
f)*x^2 + 3*(2*b^3*d^2*f*x^3*arctan2(1, d*x + c) + (2*b^3*d^2*e*arctan2(1, d
*x + c) + (4*b^3*c*arctan2(1, d*x + c) - b^3)*d*f)*x^2 + 2*(b^3*c^2*arctan2
(1, d*x + c) + b^3*arctan2(1, d*x + c))*e + 2*((2*b^3*c*arctan2(1, d*x + c)
```

```
 - b^3)*d*e + (b^3*c^2*arctan2(1, d*x + c) + b^3*arctan2(1, d*x + c))*f)*x)
*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 8*(7*b^3*arctan2(1, d*x + c)^3 + 24*a
*b^2*arctan2(1, d*x + c)^2 + (7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan
2(1, d*x + c)^2)*c^2)*e + 8*((3*b^3*arctan2(1, d*x + c)^2 + 2*(7*b^3*arctan
2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*e + (7*b^3*arctan2(1
, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2 + (7*b^3*arctan2(1, d*x + c)^
3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c^2)*f)*x + 12*(b^3*d^2*f*x^3*arctan2(1
, d*x + c) + 2*b^3*c*d*e*x*arctan2(1, d*x + c) + (2*b^3*d^2*e*arctan2(1, d*
x + c) + b^3*c*d*f*arctan2(1, d*x + c))*x^2)*log(d^2*x^2 + 2*c*d*x + c^2 +
1))/(d^2*x^2 + 2*c*d*x + c^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(a^3fx + a^3e + \left(b^3fx + b^3e\right)\text{arccot}\left(dx + c\right)^3 + 3\left(ab^2fx + ab^2e\right)\text{arccot}\left(dx + c\right)^2 + 3\left(a^2bfx + a^2be\right)\text{arccot}\left(dx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(a^3*f*x + a^3*e + (b^3*f*x + b^3*e)*arccot(d*x + c)^3 + 3*(a*b^2*f
*x + a*b^2*e)*arccot(d*x + c)^2 + 3*(a^2*b*f*x + a^2*b*e)*arccot(d*x + c),
x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(a + b\,\text{acot}\left(c + dx\right)\right)^3 \left(e + fx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*acot(d*x+c))**3,x)
```

```
[Out] Integral((a + b*acot(c + d*x))**3*(e + f*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx + e\right)\left(b\,\text{arccot}\left(dx + c\right) + a\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(a+b*arccot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((f*x + e)*(b*arccot(d*x + c) + a)^3, x)
```

3.143 $\int \left(a+b\cot^{-1}(c+dx)\right)^3\,dx$

Optimal. Leaf size=143

$$\frac{3ib^2\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d}-\frac{3b^3\text{PolyLog}\left(3,1-\frac{2}{1+i(c+dx)}\right)}{2d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d}+$$

```
[Out] (I*(a + b*ArcCot[c + d*x])^3)/d + ((c + d*x)*(a + b*ArcCot[c + d*x])^3)/d -
 (3*b*(a + b*ArcCot[c + d*x])^2*Log[2/(1 + I*(c + d*x))])/d + ((3*I)*b^2*(a
 + b*ArcCot[c + d*x])*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/d - (3*b^3*PolyL
og[3, 1 - 2/(1 + I*(c + d*x))])/(2*d)
```

Rubi [A] time = 0.216905, antiderivative size = 143, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {5040, 4847, 4921, 4855, 4885, 4995, 6610}

$$\frac{3ib^2\text{PolyLog}\left(2,1-\frac{2}{1+i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{d}-\frac{3b^3\text{PolyLog}\left(3,1-\frac{2}{1+i(c+dx)}\right)}{2d}+\frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])^3,x]
```

```
[Out] (I*(a + b*ArcCot[c + d*x])^3)/d + ((c + d*x)*(a + b*ArcCot[c + d*x])^3)/d -
 (3*b*(a + b*ArcCot[c + d*x])^2*Log[2/(1 + I*(c + d*x))])/d + ((3*I)*b^2*(a
 + b*ArcCot[c + d*x])*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/d - (3*b^3*PolyL
og[3, 1 - 2/(1 + I*(c + d*x))])/(2*d)
```

Rule 5040

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d},
x] && IGtQ[p, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \left(a+b\cot^{-1}(c+dx)\right)^3\,dx = \frac{\text{Subst}\left(\int \left(a+b\cot^{-1}(x)\right)^3\,dx, x, c+dx\right)}{d}$$

$$= \frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d} + \frac{(3b)\,\text{Subst}\left(\int \frac{x\left(a+b\cot^{-1}(x)\right)^2}{1+x^2}\,dx, x, c+dx\right)}{d}$$

$$= \frac{i\left(a+b\cot^{-1}(c+dx)\right)^3}{d} + \frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d} - \frac{(3b)\,\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^2}{i-x}\,dx\right.}{d}$$

$$= \frac{i\left(a+b\cot^{-1}(c+dx)\right)^3}{d} + \frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d} - \frac{3b\left(a+b\cot^{-1}(c+dx)\right)^2\log}{d}$$

$$= \frac{i\left(a+b\cot^{-1}(c+dx)\right)^3}{d} + \frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d} - \frac{3b\left(a+b\cot^{-1}(c+dx)\right)^2\log}{d}$$

$$= \frac{i\left(a+b\cot^{-1}(c+dx)\right)^3}{d} + \frac{(c+dx)\left(a+b\cot^{-1}(c+dx)\right)^3}{d} - \frac{3b\left(a+b\cot^{-1}(c+dx)\right)^2\log}{d}$$

Mathematica [A] time = 0.312413, size = 228, normalized size = 1.59

$$6ab^2\left(i\text{PolyLog}\left(2,e^{2i\cot^{-1}(c+dx)}\right)+\cot^{-1}(c+dx)\left((c+dx+i)\cot^{-1}(c+dx)-2\log\left(1-e^{2i\cot^{-1}(c+dx)}\right)\right)\right)+2b^3\left(-3i\cot^{-}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcCot[c + d*x])^3,x]
```

```
[Out] (2*a^3*(c + d*x) + 6*a^2*b*(c + d*x)*ArcCot[c + d*x] + 3*a^2*b*Log[1 + (c +
 d*x)^2] + 6*a*b^2*(ArcCot[c + d*x]*((I + c + d*x)*ArcCot[c + d*x] - 2*Log[
1 - E^((2*I)*ArcCot[c + d*x])]) + I*PolyLog[2, E^((2*I)*ArcCot[c + d*x])])
+ 2*b^3*((I/8)*Pi^3 - I*ArcCot[c + d*x]^3 + (c + d*x)*ArcCot[c + d*x]^3 - 3
*ArcCot[c + d*x]^2*Log[1 - E^((-2*I)*ArcCot[c + d*x])] - (3*I)*ArcCot[c + d
*x]*PolyLog[2, E^((-2*I)*ArcCot[c + d*x])] - (3*PolyLog[3, E^((-2*I)*ArcCot
[c + d*x])])/2))/(2*d)
```

Maple [B] time = 0.324, size = 507, normalized size = 3.6

$$xa^3 + \frac{a^3c}{d} + \frac{3\,i\,(\mathrm{arccot}\,(dx+c))^2\,ab^2}{d} + (\mathrm{arccot}\,(dx+c))^3\,xb^3 + \frac{(\mathrm{arccot}\,(dx+c))^3\,b^3c}{d} - 3\,\frac{(\mathrm{arccot}\,(dx+c))^2\,b^3}{d}\ln\left(1-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))^3,x)
```

```
[Out] x*a^3+1/d*a^3*c+3*I/d*arccot(d*x+c)^2*a*b^2+arccot(d*x+c)^3*x*b^3+1/d*arcco
t(d*x+c)^3*b^3*c-3/d*arccot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^
3-3/d*arccot(d*x+c)^2*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^3+6*I/d*arccot(
d*x+c)*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^3+6*I/d*arccot(d*x+c)*po
lylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^3-6/d*polylog(3,-(d*x+c+I)/(1+(d*x
+c)^2)^(1/2))*b^3-6/d*polylog(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*b^3+6*I/d*po
lylog(2,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*a*b^2+3*arccot(d*x+c)^2*x*a*b^2+3/d*
arccot(d*x+c)^2*a*b^2*c-6/d*arccot(d*x+c)*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2
))*a*b^2-6/d*arccot(d*x+c)*ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*a*b^2+I/d*ar
ccot(d*x+c)^3*b^3+6*I/d*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))*a*b^2+3*a
rccot(d*x+c)*x*a^2*b+3/d*arccot(d*x+c)*a^2*b*c+3/2/d*a^2*b*ln(1+(d*x+c)^2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{8}\,b^3x\arctan\left(1,dx+c\right)^3 - \frac{3}{32}\,b^3x\arctan\left(1,dx+c\right)\log\left(d^2x^2+2\,cdx+c^2+1\right)^2 + a^3x + \frac{3\left(2\,(dx+c)\,\mathrm{arccot}\,(dx+c)\right.}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*b^3*x*arctan2(1, d*x + c)^3 - 3/32*b^3*x*arctan2(1, d*x + c)*log(d^2*x^
2 + 2*c*d*x + c^2 + 1)^2 + a^3*x + 3/2*(2*(d*x + c)*arccot(d*x + c) + log((
d*x + c)^2 + 1))*a^2*b/d + integrate(1/32*(28*b^3*arctan2(1, d*x + c)^3 + 4
*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*d^2*x^2 + 9
6*a*b^2*arctan2(1, d*x + c)^2 + 4*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*a
rctan2(1, d*x + c)^2)*c^2 + 4*(3*b^3*arctan2(1, d*x + c)^2 + 2*(7*b^3*arcta
n2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*x + 3*(b^3*d^2*x^2*
arctan2(1, d*x + c) + b^3*c^2*arctan2(1, d*x + c) + b^3*arctan2(1, d*x + c)
 + (2*b^3*c*arctan2(1, d*x + c) - b^3)*d*x)*log(d^2*x^2 + 2*c*d*x + c^2 + 1
)^2 + 12*(b^3*d^2*x^2*arctan2(1, d*x + c) + b^3*c*d*x*arctan2(1, d*x + c))*
```

```
log(d^2*x^2 + 2*c*d*x + c^2 + 1))/(d^2*x^2 + 2*c*d*x + c^2 + 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(b^3 \operatorname{arccot}(dx+c)^3 + 3\,ab^2 \operatorname{arccot}(dx+c)^2 + 3\,a^2 b \operatorname{arccot}(dx+c) + a^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(b^3*arccot(d*x + c)^3 + 3*a*b^2*arccot(d*x + c)^2 + 3*a^2*b*arccot
(d*x + c) + a^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b \operatorname{acot}(c+dx))^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))**3,x)
```

```
[Out] Integral((a + b*acot(c + d*x))**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (b \operatorname{arccot}(dx+c) + a)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^3, x)
```

3.144 $\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{e+fx}\,dx$

Optimal. Leaf size=372

$$\frac{3b^2\left(a+b\cot^{-1}(c+dx)\right)\text{PolyLog}\left(3,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{2f}-\frac{3b^2\text{PolyLog}\left(3,1-\frac{2}{1-i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{2f}+$$

```
[Out] -(((a + b*ArcCot[c + d*x])^3*Log[2/(1 - I*(c + d*x))])/f) + ((a + b*ArcCot[
c + d*x])^3*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f -
 (((3*I)/2)*b*(a + b*ArcCot[c + d*x])^2*PolyLog[2, 1 - 2/(1 - I*(c + d*x))]
)/f + (((3*I)/2)*b*(a + b*ArcCot[c + d*x])^2*PolyLog[2, 1 - (2*d*(e + f*x))
/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f - (3*b^2*(a + b*ArcCot[c + d*x])
*PolyLog[3, 1 - 2/(1 - I*(c + d*x))])/(2*f) + (3*b^2*(a + b*ArcCot[c + d*x]
)*PolyLog[3, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/(2
*f) + (((3*I)/4)*b^3*PolyLog[4, 1 - 2/(1 - I*(c + d*x))])/f - (((3*I)/4)*b^
3*PolyLog[4, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f
```

Rubi [A] time = 0.215706, antiderivative size = 372, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {5048, 4861}

$$\frac{3b^2\left(a+b\cot^{-1}(c+dx)\right)\text{PolyLog}\left(3,1-\frac{2d(e+fx)}{(1-i(c+dx))(-cf+de+if)}\right)}{2f}-\frac{3b^2\text{PolyLog}\left(3,1-\frac{2}{1-i(c+dx)}\right)\left(a+b\cot^{-1}(c+dx)\right)}{2f}+$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])^3/(e + f*x),x]
```


```
[Out] -(((a + b*ArcCot[c + d*x])^3*Log[2/(1 - I*(c + d*x))])/f) + ((a + b*ArcCot[
c + d*x])^3*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f -
 (((3*I)/2)*b*(a + b*ArcCot[c + d*x])^2*PolyLog[2, 1 - 2/(1 - I*(c + d*x))]
)/f + (((3*I)/2)*b*(a + b*ArcCot[c + d*x])^2*PolyLog[2, 1 - (2*d*(e + f*x))
/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f - (3*b^2*(a + b*ArcCot[c + d*x])
*PolyLog[3, 1 - 2/(1 - I*(c + d*x))])/(2*f) + (3*b^2*(a + b*ArcCot[c + d*x]
)*PolyLog[3, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/(2
*f) + (((3*I)/4)*b^3*PolyLog[4, 1 - 2/(1 - I*(c + d*x))])/f - (((3*I)/4)*b^
3*PolyLog[4, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/f
```


Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4861

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^3/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcCot[c*x])^3*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcC
ot[c*x])^3*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] - Simp[(3*
I*b*(a + b*ArcCot[c*x])^2*PolyLog[2, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(
3*I*b*(a + b*ArcCot[c*x])^2*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1
- I*c*x))])/(2*e), x] - Simp[(3*b^2*(a + b*ArcCot[c*x])*PolyLog[3, 1 - 2/(1
 - I*c*x)])/(2*e), x] + Simp[(3*b^2*(a + b*ArcCot[c*x])*PolyLog[3, 1 - (2*c
*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x] + Simp[(3*I*b^3*PolyLog[4
, 1 - 2/(1 - I*c*x)])/(4*e), x] - Simp[(3*I*b^3*PolyLog[4, 1 - (2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))])/(4*e), x]) /; FreeQ[{a, b, c, d, e}, x] &&
NeQ[c^2*d^2 + e^2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{e+fx}\,dx=\frac{\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^3}{\frac{de-cf}{d}+\frac{fx}{d}}\,dx,x,c+dx\right)}{d}$$

$$=-\frac{\left(a+b\cot^{-1}(c+dx)\right)^3\log\left(\frac{2}{1-i(c+dx)}\right)}{f}+\frac{\left(a+b\cot^{-1}(c+dx)\right)^3\log\left(\frac{2d(e+fx)}{(de+if-cf)(1-i(c+dx))}\right)}{f}-$$

Mathematica [F] time = 55.631, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{e+fx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcCot[c + d*x])^3/(e + f*x),x]
```

```
[Out] Integrate[(a + b*ArcCot[c + d*x])^3/(e + f*x), x]
```

Maple [C] time = 0.865, size = 4521, normalized size = 12.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))^3/(f*x+e),x)
```

```
[Out] a^3*ln(f*(d*x+c)-c*f+d*e)/f+3/4*b^3/(-I*f+c*f-d*e)*polylog(4,(d*e+I*f-c*f)/
(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-6*b^3/f*arccot(d*x+c)*polylog(3,-
(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+b^3/f*arccot(d*x+c)^3*ln((d*x+c+I)^2/(1+(d*x
+c)^2)-1)+b^3*ln(f*(d*x+c)-c*f+d*e)/f*arccot(d*x+c)^3-6*I*b^3/f*polylog(4,(
d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6*I*b^3/f*polylog(4,-(d*x+c+I)/(1+(d*x+c)^2)^
(1/2))-6*a*b^2/f*polylog(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-6*a*b^2/f*polylog
(3,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-3/2*b^3/(-I*f+c*f-d*e)*arccot(d*x+c)^2*p
olylog(2,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-6*b^3/f*ar
ccot(d*x+c)*polylog(3,(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-b^3/f*arccot(d*x+c)^3*
ln(1+(d*x+c+I)/(1+(d*x+c)^2)^(1/2))-b^3/f*arccot(d*x+c)^3*ln(1-(d*x+c+I)/(1
+(d*x+c)^2)^(1/2))-b^3/f*arccot(d*x+c)^3*ln(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d
*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)+3*I
*d*b^3/f*e*arccot(d*x+c)^2*polylog(2,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)
^2/(1+(d*x+c)^2))/(-2*I*f+2*c*f-2*d*e)-3/2*I*a*b^2/f*Pi*arccot(d*x+c)^2*csg
n(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*
(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e
*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x
+c+I)^2/(1+(d*x+c)^2)-1))^2-3/2*I*a*b^2/f*Pi*arccot(d*x+c)^2*csgn(I/((d*x+c
+I)^2/(1+(d*x+c)^2)-1))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)
^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1
+(d*x+c)^2)-1))^2+1/2*I*b^3/f*Pi*arccot(d*x+c)^3*csgn(I/((d*x+c+I)^2/(1+(d*
x+c)^2)-1))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c
)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f))*csgn(I*(c*f*(d*x+c+I)^2/(1
+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^
2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1))+3/2*a*b^2*c/(-I*f+c*f-d*e)*polylog
(3,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))+3*a*b^2*ln(f*(d*
x+c)-c*f+d*e)/f*arccot(d*x+c)^2-3*a*b^2/f*arccot(d*x+c)^2*ln(1+(d*x+c+I)/(1
+(d*x+c)^2)^(1/2))+3*I*b^3/f*arccot(d*x+c)^2*polylog(2,(d*x+c+I)/(1+(d*x+c)
^2)^(1/2))+3*I*b^3/f*arccot(d*x+c)^2*polylog(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/
2))-I*b^3/(-I*f+c*f-d*e)*arccot(d*x+c)^3*ln(1-(d*e+I*f-c*f)/(-c*f+d*e-I*f)*
(d*x+c+I)^2/(1+(d*x+c)^2))-3/2*I*b^3/(-I*f+c*f-d*e)*arccot(d*x+c)*polylog(3
,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))+3/2*I*a^2*b/f*dilo
g((I*f+f*(d*x+c))/(I*f+c*f-d*e))-3/2*I*a*b^2/(-I*f+c*f-d*e)*polylog(3,(d*e+
I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-3/2*I*a^2*b/f*dilog((I*f
-f*(d*x+c))/(d*e+I*f-c*f))-I*b^3/f*arccot(d*x+c)^3*Pi+3/4*I*b^3*c/(-I*f+c*f
-d*e)*polylog(4,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-3*a
```

```
*b^2/f*arccot(d*x+c)^2*ln(1-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+3*a*b^2/f*arccot
(d*x+c)^2*ln((d*x+c+I)^2/(1+(d*x+c)^2)-1)-3*a*b^2/(-I*f+c*f-d*e)*arccot(d*x
+c)*polylog(2,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-3*a*b
^2/f*arccot(d*x+c)^2*ln(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d
*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)+3*a^2*b*ln(f*(d*x+c)-c*
f+d*e)/f*arccot(d*x+c)+3/2*b^3*c/(-I*f+c*f-d*e)*arccot(d*x+c)*polylog(3,(d*
e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-3*d*a*b^2/f*e/(-I*f+c*
f-d*e)*arccot(d*x+c)^2*ln(1-(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*
x+c)^2))+b^3*c/(-I*f+c*f-d*e)*arccot(d*x+c)^3*ln(1-(d*e+I*f-c*f)/(-c*f+d*e-
I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))+3*a*b^2*c/(-I*f+c*f-d*e)*arccot(d*x+c)^2*ln
(1-(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))+I*b^3/f*Pi*arcco
t(d*x+c)^3*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)
^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1
))^2-3/2*d*a*b^2/f*e/(-I*f+c*f-d*e)*polylog(3,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*
(d*x+c+I)^2/(1+(d*x+c)^2))-3/2*d*b^3/f*e/(-I*f+c*f-d*e)*arccot(d*x+c)*polyl
og(3,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-d*b^3/f*e/(-I*
f+c*f-d*e)*arccot(d*x+c)^3*ln(1-(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1
+(d*x+c)^2))+3*I*a*b^2/f*Pi*arccot(d*x+c)^2*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x
+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-
I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1))^2-1/2*I*b^3/f*Pi*arccot(d*x+c)^3*csgn(I
*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*
x+c+I)^2/(1+(d*x+c)^2)*f-I*f))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d
*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+
I)^2/(1+(d*x+c)^2)-1))^2-1/2*I*b^3/f*Pi*arccot(d*x+c)^3*csgn(I/((d*x+c+I)^2
/(1+(d*x+c)^2)-1))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1
+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x
+c)^2)-1))^2-3*I*a*b^2*c/(-I*f+c*f-d*e)*arccot(d*x+c)*polylog(2,(d*e+I*f-c*
f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-3/2*I*a*b^2/f*Pi*arccot(d*x+c)
^2*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+
d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1))^3-3*I
*d*b^3/f*e*polylog(4,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2)
)/(-4*I*f+4*c*f-4*d*e)-3/2*I*a^2*b*ln(f*(d*x+c)-c*f+d*e)/f*ln((I*f-f*(d*x+c
))/(d*e+I*f-c*f))+3/2*I*a^2*b*ln(f*(d*x+c)-c*f+d*e)/f*ln((I*f+f*(d*x+c))/(I
*f+c*f-d*e))-3*I*a*b^2/f*Pi*arccot(d*x+c)^2+6*I*a*b^2/f*arccot(d*x+c)*polyl
og(2,-(d*x+c+I)/(1+(d*x+c)^2)^(1/2))+6*I*a*b^2/f*arccot(d*x+c)*polylog(2,(d
*x+c+I)/(1+(d*x+c)^2)^(1/2))-3*I*a*b^2/(-I*f+c*f-d*e)*arccot(d*x+c)^2*ln(1-
(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))-1/2*I*b^3/f*Pi*arcc
ot(d*x+c)^3*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c
)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-
1))^3-3/2*I*b^3*c/(-I*f+c*f-d*e)*arccot(d*x+c)^2*polylog(2,(d*e+I*f-c*f)/(-
c*f+d*e-I*f)*(d*x+c+I)^2/(1+(d*x+c)^2))+3/2*I*a*b^2/f*Pi*arccot(d*x+c)^2*cs
gn(I/((d*x+c+I)^2/(1+(d*x+c)^2)-1))*csgn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d
*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f))*cs
gn(I*(c*f*(d*x+c+I)^2/(1+(d*x+c)^2)-d*e*(d*x+c+I)^2/(1+(d*x+c)^2)-c*f+d*e-I
*(d*x+c+I)^2/(1+(d*x+c)^2)*f-I*f)/((d*x+c+I)^2/(1+(d*x+c)^2)-1))+6*I*d*a*b^
```

```
2/f*e*arccot(d*x+c)*polylog(2,(d*e+I*f-c*f)/(-c*f+d*e-I*f)*(d*x+c+I)^2/(1+(
d*x+c)^2))/(-2*I*f+2*c*f-2*d*e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^3\log\left(fx+e\right)}{f}+\int\frac{28\,b^3\arctan\left(1,dx+c\right)^3+3\,b^3\arctan\left(1,dx+c\right)\log\left(d^2x^2+2\,cdx+c^2+1\right)^2+96\,ab^2\arctan\left(1,d\right.}{32\left(fx+e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3/(f*x+e),x, algorithm="maxima")
```

```
[Out] a^3*log(f*x + e)/f + integrate(1/32*(28*b^3*arctan2(1, d*x + c)^3 + 3*b^3*a
rctan2(1, d*x + c)*log(d^2*x^2 + 2*c*d*x + c^2 + 1)^2 + 96*a*b^2*arctan2(1,
 d*x + c)^2 + 96*a^2*b*arctan2(1, d*x + c))/(f*x + e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^3\operatorname{arccot}\left(dx+c\right)^3+3\,ab^2\operatorname{arccot}\left(dx+c\right)^2+3\,a^2b\operatorname{arccot}\left(dx+c\right)+a^3}{fx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3/(f*x+e),x, algorithm="fricas")
```

```
[Out] integral((b^3*arccot(d*x + c)^3 + 3*a*b^2*arccot(d*x + c)^2 + 3*a^2*b*arcco
t(d*x + c) + a^3)/(f*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))**3/(f*x+e),x)
```

[Out] Timed out

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \operatorname{arccot}(dx+c)+a)^3}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^3/(f*x + e), x)
```

3.145 $\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{(e+fx)^2}\,dx$

Optimal. Leaf size=1233

result too large to display

```
[Out] ((3*I)*a*b^2*d*ArcCot[c + d*x]^2)/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (
3*a*b^2*d*(d*e - c*f)*ArcCot[c + d*x]^2)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2
)*f^2)) + (I*b^3*d*ArcCot[c + d*x]^3)/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)
 + (b^3*d*(d*e - c*f)*ArcCot[c + d*x]^3)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2
)*f^2)) - (a + b*ArcCot[c + d*x])^3/(f*(e + f*x)) - (3*a^2*b*d*(d*e - c*f)*
ArcTan[c + d*x])/(f*(f^2 + (d*e - c*f)^2)) - (3*a^2*b*d*Log[e + f*x])/(f^2
+ (d*e - c*f)^2) + (6*a*b^2*d*ArcCot[c + d*x]*Log[2/(1 - I*(c + d*x))])/(d^
2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (3*b^3*d*ArcCot[c + d*x]^2*Log[2/(1 -
I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) - (6*a*b^2*d*ArcCot[c
+ d*x]*Log[(2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/(d^2*e^2
 - 2*c*d*e*f + (1 + c^2)*f^2) - (3*b^3*d*ArcCot[c + d*x]^2*Log[(2*d*(e + f*
x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2
)*f^2) - (6*a*b^2*d*ArcCot[c + d*x]*Log[2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*
c*d*e*f + (1 + c^2)*f^2) - (3*b^3*d*ArcCot[c + d*x]^2*Log[2/(1 + I*(c + d*x
))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (3*a^2*b*d*Log[1 + (c + d*x)^2
])/(2*(f^2 + (d*e - c*f)^2)) + ((3*I)*a*b^2*d*PolyLog[2, 1 - 2/(1 - I*(c +
d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + ((3*I)*b^3*d*ArcCot[c + d*x
]*PolyLog[2, 1 - 2/(1 - I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2
) - ((3*I)*a*b^2*d*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I
*(c + d*x)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) - ((3*I)*b^3*d*ArcCot[
c + d*x]*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + I*f - c*f)*(1 - I*(c + d*x)
))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + ((3*I)*a*b^2*d*PolyLog[2, 1 -
2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + ((3*I)*b^3*d*
ArcCot[c + d*x]*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f +
 (1 + c^2)*f^2) + (3*b^3*d*PolyLog[3, 1 - 2/(1 - I*(c + d*x))])/(2*(d^2*e^2
 - 2*c*d*e*f + (1 + c^2)*f^2)) - (3*b^3*d*PolyLog[3, 1 - (2*d*(e + f*x))/((
d*e + I*f - c*f)*(1 - I*(c + d*x)))])/(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f
^2)) - (3*b^3*d*PolyLog[3, 1 - 2/(1 + I*(c + d*x))])/(2*(d^2*e^2 - 2*c*d*e*
f + (1 + c^2)*f^2))
```

Rubi [A] time = 2.25367, antiderivative size = 1233, normalized size of antiderivative = 1., number of steps used = 35, number of rules used = 22, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.1, Rules used = {5046, 6741, 5058, 6688, 12, 6725, 706, 31, 635, 203, 260, 4857, 2402, 2315, 2447, 4985, 4885, 4921, 4855, 4859, 4995, 6610}

$$\frac{id\cot^{-1}(c+dx)^3b^3}{d^2e^2-2cdfe+\left(c^2+1\right)f^2}+\frac{d(de-cf)\cot^{-1}(c+dx)^3b^3}{f\left(d^2e^2-2cdfe+\left(c^2+1\right)f^2\right)}+\frac{3d\cot^{-1}(c+dx)^2\log\left(\frac{2}{1-i(c+dx)}\right)b^3}{d^2e^2-2cdfe+\left(c^2+1\right)f^2}-\frac{3d\cot^{-1}(c+dx)^2\log}{d^2e^2-2cdf}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[c + d*x])^3/(e + f*x)^2,x]
```

```
[Out] ((3*I)*a*b^2*d*ArcCot[c + d*x]^2)/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (
3*a*b^2*d*(d*e - c*f)*ArcCot[c + d*x]^2)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2
)*f^2)) + (I*b^3*d*ArcCot[c + d*x]^3)/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2)
 + (b^3*d*(d*e - c*f)*ArcCot[c + d*x]^3)/(f*(d^2*e^2 - 2*c*d*e*f + (1 + c^2
)*f^2)) - (a + b*ArcCot[c + d*x])^3/(f*(e + f*x)) - (3*a^2*b*d*(d*e - c*f)*
ArcTan[c + d*x])/(f*(f^2 + (d*e - c*f)^2)) - (3*a^2*b*d*Log[e + f*x])/(f^2
+ (d*e - c*f)^2) + (6*a*b^2*d*ArcCot[c + d*x]*Log[2/(1 - I*(c + d*x))])/(d^
2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (3*b^3*d*ArcCot[c + d*x]^2*Log[2/(1 -
I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) - (6*a*b^2*d*ArcCot[c
+ d*x]*Log[(2*d*(e + f*x))/((d*e + (I - c)*f)*(1 - I*(c + d*x)))])/(d^2*e^2
 - 2*c*d*e*f + (1 + c^2)*f^2) - (3*b^3*d*ArcCot[c + d*x]^2*Log[(2*d*(e + f*
x))/((d*e + (I - c)*f)*(1 - I*(c + d*x)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2
)*f^2) - (6*a*b^2*d*ArcCot[c + d*x]*Log[2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*
c*d*e*f + (1 + c^2)*f^2) - (3*b^3*d*ArcCot[c + d*x]^2*Log[2/(1 + I*(c + d*x
))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + (3*a^2*b*d*Log[1 + (c + d*x)^2
])/(2*(f^2 + (d*e - c*f)^2)) + ((3*I)*a*b^2*d*PolyLog[2, 1 - 2/(1 - I*(c +
d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + ((3*I)*b^3*d*ArcCot[c + d*x
]*PolyLog[2, 1 - 2/(1 - I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2
) - ((3*I)*a*b^2*d*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + (I - c)*f)*(1 - I
*(c + d*x)))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) - ((3*I)*b^3*d*ArcCot[
c + d*x]*PolyLog[2, 1 - (2*d*(e + f*x))/((d*e + (I - c)*f)*(1 - I*(c + d*x)
))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + ((3*I)*a*b^2*d*PolyLog[2, 1 -
2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f^2) + ((3*I)*b^3*d*
ArcCot[c + d*x]*PolyLog[2, 1 - 2/(1 + I*(c + d*x))])/(d^2*e^2 - 2*c*d*e*f +
 (1 + c^2)*f^2) + (3*b^3*d*PolyLog[3, 1 - 2/(1 - I*(c + d*x))])/(2*(d^2*e^2
 - 2*c*d*e*f + (1 + c^2)*f^2)) - (3*b^3*d*PolyLog[3, 1 - (2*d*(e + f*x))/((
d*e + (I - c)*f)*(1 - I*(c + d*x)))])/(2*(d^2*e^2 - 2*c*d*e*f + (1 + c^2)*f
^2)) - (3*b^3*d*PolyLog[3, 1 - 2/(1 + I*(c + d*x))])/(2*(d^2*e^2 - 2*c*d*e*
f + (1 + c^2)*f^2))
```

<u>Rule 5046</u>

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_), x_Symbol] :> Simp[((e + f*x)^(m + 1)*(a + b*ArcCot[c + d*x])^p)/(f*(m +
 1)), x] + Dist[(b*d*p)/(f*(m + 1)), Int[((e + f*x)^(m + 1)*(a + b*ArcCot[c
```

```
+ d*x])^(p - 1))/(1 + (c + d*x)^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x]
&& IGtQ[p, 0] && ILtQ[m, -1]
```

Rule 6741

```
Int[u_, x_Symbol] :> With[{v = NormalizeIntegrand[u, x]}, Int[v, x] /; v =!
= u]
```

Rule 5058

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.)*((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)^(q_.), x_Symbol] :> Dist[1/d, Subst
[Int[((d*e - c*f)/d + (f*x)/d)^m*(C/d^2 + (C*x^2)/d^2)^q*(a + b*ArcCot[x])^
p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, m, p, q}, x] &&
 EqQ[B*(1 + c^2) - 2*A*c*d, 0] && EqQ[2*c*C - B*d, 0]
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rule 706

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[e^2/(c
*d^2 + a*e^2), Int[1/(d + e*x), x], x] + Dist[1/(c*d^2 + a*e^2), Int[(c*d -
 c*e*x)/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2,
 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4985

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcCot[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4921

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist[
1/(c*d), Int[(a + b*ArcCot[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4855

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcCot[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] - Dist[(b*c*p)
/e, Int[((a + b*ArcCot[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4859

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcCot[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcC
ot[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] - Simp[(I*
b*(a + b*ArcCot[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] + Simp[(I*b*(a +
 b*ArcCot[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4995

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{(e+fx)^2}\,dx = -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{(3bd)\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{(e+fx)\left(1+(c+dx)^2\right)}\,dx}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{(3bd)\int \frac{\left(a+b\cot^{-1}(c+dx)\right)^2}{(e+fx)\left(1+c^2+2cdx+d^2x^2\right)}\,dx}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{(3b)\,\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^2}{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)\left(1+x^2\right)}\,dx, x, c+dx\right)}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{(3b)\,\text{Subst}\left(\int \frac{d\left(a+b\cot^{-1}(x)\right)^2}{(de-cf+fx)\left(1+x^2\right)}\,dx, x, c+dx\right)}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{(3bd)\,\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^2}{(de-cf+fx)\left(1+x^2\right)}\,dx, x, c+dx\right)}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{(3bd)\,\text{Subst}\left(\int \left(\frac{a^2}{(de-cf+fx)\left(1+x^2\right)} + \frac{2ab\cot^{-1}(x)}{(de-cf+fx)\left(1+x^2\right)} + \frac{b^2\cot^{-1}}{(de-cf+fx)}\right.\right.}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{\left(3a^2bd\right)\text{Subst}\left(\int \frac{1}{(de-cf+fx)\left(1+x^2\right)}\,dx, x, c+dx\right)}{f} - \frac{\left(6ab^2d\right)\text{Su}}{}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{\left(6ab^2d\right)\text{Subst}\left(\int \left(\frac{f^2\cot^{-1}(x)}{\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)(de-cf+fx)} + \frac{(de-cf-}{\left(d^2e^2-2cdef+\right.}\right.\right.}{f}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{3a^2bd\log(e+fx)}{f^2+(de-cf)^2} - \frac{\left(6ab^2d\right)\text{Subst}\left(\int \frac{(de-cf-fx)\cot^{-1}(x)}{1+x^2}\,dx, x,\right.}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{3a^2bd(de-cf)\tan^{-1}(c+dx)}{f\left(f^2+(de-cf)^2\right)} - \frac{3a^2bd\log(e+fx)}{f^2+(de-cf)^2} + \frac{6ab^2d\,\text{c}}{d^2e^2}$$

$$= -\frac{\left(a+b\cot^{-1}(c+dx)\right)^3}{f(e+fx)} - \frac{3a^2bd(de-cf)\tan^{-1}(c+dx)}{f\left(f^2+(de-cf)^2\right)} - \frac{3a^2bd\log(e+fx)}{f^2+(de-cf)^2} + \frac{6ab^2d\,\text{c}}{d^2e^2}$$

$$= \frac{3iab^2d\cot^{-1}(c+dx)^2}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{3ab^2d(de-cf)\cot^{-1}(c+dx)^2}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} + \frac{ib^3d\cot^{-1}(c+dx)^3}{d^2e^2-2cdef+\left(1+c^2\right)f}$$

$$= \frac{3iab^2d\cot^{-1}(c+dx)^2}{d^2e^2-2cdef+\left(1+c^2\right)f^2} + \frac{3ab^2d(de-cf)\cot^{-1}(c+dx)^2}{f\left(d^2e^2-2cdef+\left(1+c^2\right)f^2\right)} + \frac{ib^3d\cot^{-1}(c+dx)^3}{d^2e^2-2cdef+\left(1+c^2\right)f}$$

$$= \frac{3iab^2d\cot^{-1}(c+dx)^2}{} + \frac{3ab^2d(de-cf)\cot^{-1}(c+dx)^2}{} + \frac{ib^3d\cot^{-1}(c+dx)^3}{}$$

Mathematica [F] time = 60.4162, size = 0, normalized size = 0.

$$\int \frac{\left(a + b\cot^{-1}(c + dx)\right)^3}{(e + fx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcCot[c + d*x])^3/(e + f*x)^2,x]
```

```
[Out] Integrate[(a + b*ArcCot[c + d*x])^3/(e + f*x)^2, x]
```

Maple [A] time = 0.522, size = 1579, normalized size = 1.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(d*x+c))^3/(f*x+e)^2,x)
```

```
[Out] 3/2*d*a^2*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(1+(d*x+c)^2)-6*d*a*b^2*arcco
t(d*x+c)/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(f*(d*x+c)-c*f+d*e)-3*d*a^2*b/(d
*f*x+d*e)/f*arccot(d*x+c)-3*d*a*b^2/(d*f*x+d*e)/f*arccot(d*x+c)^2+2*I*d*b^3
/(-I*f+c*f-d*e)/(I*f+c*f-d*e)*arccot(d*x+c)^3+3/4*I*d*a*b^2/(c^2*f^2-2*c*d*
e*f+d^2*e^2+f^2)*ln(d*x+c-I)^2+3/2*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2
)*dilog(-1/2*I*(d*x+c+I))-3*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*dilog
((I*f+f*(d*x+c))/(I*f+c*f-d*e))+3*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)
*dilog((I*f-f*(d*x+c))/(d*e+I*f-c*f))+3*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+
f^2)*arctan(d*x+c)^2*c+3*d*a^2*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x
+c)*c-3*d*b^3/(-I*f+c*f-d*e)/(I*f+c*f-d*e)*arccot(d*x+c)^2*ln(1-(-I*f+c*f-d
*e)*(d*x+c+I)^2/(1+(d*x+c)^2)/(I*f+c*f-d*e))+3*d*a*b^2*arccot(d*x+c)/(c^2*f
^2-2*c*d*e*f+d^2*e^2+f^2)*ln(1+(d*x+c)^2)-3/2*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+
d^2*e^2+f^2)*dilog(1/2*I*(d*x+c-I))-3/4*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^
2+f^2)*ln(d*x+c+I)^2-3*d*a^2*b/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(f*(d*x+c)
-c*f+d*e)-d*b^3/f*arccot(d*x+c)^3/(-I*f+c*f-d*e)-3/2*d*b^3/(-I*f+c*f-d*e)/(
I*f+c*f-d*e)*polylog(3,(-I*f+c*f-d*e)*(d*x+c+I)^2/(1+(d*x+c)^2)/(I*f+c*f-d*
e))-d*b^3/(d*f*x+d*e)/f*arccot(d*x+c)^3-6*d^2*a*b^2/f*arccot(d*x+c)/(c^2*f^
2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)*e-d*a^3/(d*f*x+d*e)/f-3*d^2*a*b^2/f/
(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)^2*e-3*d^2*a^2*b/f/(c^2*f^2-2*
c*d*e*f+d^2*e^2+f^2)*arctan(d*x+c)*e+6*d*a*b^2*arccot(d*x+c)/(c^2*f^2-2*c*d
*e*f+d^2*e^2+f^2)*arctan(d*x+c)*c-3*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^
2)*ln(f*(d*x+c)-c*f+d*e)*ln((I*f+f*(d*x+c))/(I*f+c*f-d*e))-3/2*I*d*a*b^2/(c
```

```
^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c+I)*ln(1/2*I*(d*x+c-I))+3/2*I*d*a*b^2
/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c-I)*ln(-1/2*I*(d*x+c+I))-3/2*I*d*a
*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(d*x+c-I)*ln(1+(d*x+c)^2)+3/2*I*d*a*
b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2)*ln(1+(d*x+c)^2)*ln(d*x+c+I)+3*I*d*b^3/(
-I*f+c*f-d*e)/(I*f+c*f-d*e)*arccot(d*x+c)*polylog(2,(-I*f+c*f-d*e)*(d*x+c+I
)^2/(1+(d*x+c)^2)/(I*f+c*f-d*e))+3*I*d*a*b^2/(c^2*f^2-2*c*d*e*f+d^2*e^2+f^2
)*ln(f*(d*x+c)-c*f+d*e)*ln((I*f-f*(d*x+c))/(d*e+I*f-c*f))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3/(f*x+e)^2,x, algorithm="maxima")
```

```
[Out] -3/2*(d*(2*(d^2*e - c*d*f)*arctan((d^2*x + c*d)/d)/((d^2*e^2*f - 2*c*d*e*f^
2 + (c^2 + 1)*f^3)*d) - log(d^2*x^2 + 2*c*d*x + c^2 + 1)/(d^2*e^2 - 2*c*d*e
*f + (c^2 + 1)*f^2) + 2*log(f*x + e)/(d^2*e^2 - 2*c*d*e*f + (c^2 + 1)*f^2))
 + 2*arccot(d*x + c)/(f^2*x + e*f))*a^2*b - a^3/(f^2*x + e*f) - 1/32*(4*b^3
*arctan2(1, d*x + c)^3 - 3*b^3*arctan2(1, d*x + c)*log(d^2*x^2 + 2*c*d*x +
c^2 + 1)^2 - 32*(f^2*x + e*f)*integrate(-1/32*(12*b^3*d*e*arctan2(1, d*x +
c)^2 - 4*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*d^2
*f*x^2 + 4*(3*b^3*arctan2(1, d*x + c)^2 - 2*(7*b^3*arctan2(1, d*x + c)^3 +
24*a*b^2*arctan2(1, d*x + c)^2)*c)*d*f*x - 3*(b^3*d^2*f*x^2*arctan2(1, d*x
+ c) + b^3*d*e + (2*b^3*c*arctan2(1, d*x + c) + b^3)*d*f*x + (b^3*c^2*arcta
n2(1, d*x + c) + b^3*arctan2(1, d*x + c))*f)*log(d^2*x^2 + 2*c*d*x + c^2 +
1)^2 - 4*(7*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2 + (7
*b^3*arctan2(1, d*x + c)^3 + 24*a*b^2*arctan2(1, d*x + c)^2)*c^2)*f + 12*(b
^3*d^2*f*x^2*arctan2(1, d*x + c) + b^3*c*d*e*arctan2(1, d*x + c) + (b^3*d^2
*e*arctan2(1, d*x + c) + b^3*c*d*f*arctan2(1, d*x + c))*x)*log(d^2*x^2 + 2*
c*d*x + c^2 + 1))/(d^2*f^3*x^4 + (c^2 + 1)*e^2*f + 2*(d^2*e*f^2 + c*d*f^3)*
x^3 + (d^2*e^2*f + 4*c*d*e*f^2 + (c^2 + 1)*f^3)*x^2 + 2*(c*d*e^2*f + (c^2 +
 1)*e*f^2)*x), x))/(f^2*x + e*f)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^3 \operatorname{arccot}(dx+c)^3 + 3\,ab^2 \operatorname{arccot}(dx+c)^2 + 3\,a^2b \operatorname{arccot}(dx+c) + a^3}{f^2x^2 + 2\,efx + e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3/(f*x+e)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*arccot(d*x + c)^3 + 3*a*b^2*arccot(d*x + c)^2 + 3*a^2*b*arcco
t(d*x + c) + a^3)/(f^2*x^2 + 2*e*f*x + e^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(d*x+c))**3/(f*x+e)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \operatorname{arccot}(dx + c) + a)^3}{(fx + e)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(d*x+c))^3/(f*x+e)^2,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^3/(f*x + e)^2, x)
```

3.146 $\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)\,dx$

Optimal. Leaf size=177

$$\frac{(e+fx)^{m+1}\left(a+b\cot^{-1}(c+dx)\right)}{f(m+1)}+\frac{ibd(e+fx)^{m+2}\,{}_2F_1\left(1,m+2;m+3;\frac{d(e+fx)}{de-cf+if}\right)}{2f(m+1)(m+2)(de+(-c+i)f)}-\frac{ibd(e+fx)^{m+2}\,{}_2F_1\left(1,m+2;m+3\right.}{2f(m+1)(m+2)(de-(c+}$$

```
[Out] ((e + f*x)^(1 + m)*(a + b*ArcCot[c + d*x]))/(f*(1 + m)) + ((I/2)*b*d*(e + f
*x)^(2 + m)*Hypergeometric2F1[1, 2 + m, 3 + m, (d*(e + f*x))/(d*e + I*f - c
*f)])/(f*(d*e + (I - c)*f)*(1 + m)*(2 + m)) - ((I/2)*b*d*(e + f*x)^(2 + m)*
Hypergeometric2F1[1, 2 + m, 3 + m, (d*(e + f*x))/(d*e - (I + c)*f)])/(f*(d*
e - (I + c)*f)*(1 + m)*(2 + m))
```

Rubi [A] time = 0.243636, antiderivative size = 177, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {5048, 4863, 712, 68}

$$\frac{(e+fx)^{m+1}\left(a+b\cot^{-1}(c+dx)\right)}{f(m+1)}+\frac{ibd(e+fx)^{m+2}\,{}_2F_1\left(1,m+2;m+3;\frac{d(e+fx)}{de-cf+if}\right)}{2f(m+1)(m+2)(de+(-c+i)f)}-\frac{ibd(e+fx)^{m+2}\,{}_2F_1\left(1,m+2;m+3\right.}{2f(m+1)(m+2)(de-(c+}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^m*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] ((e + f*x)^(1 + m)*(a + b*ArcCot[c + d*x]))/(f*(1 + m)) + ((I/2)*b*d*(e + f
*x)^(2 + m)*Hypergeometric2F1[1, 2 + m, 3 + m, (d*(e + f*x))/(d*e + I*f - c
*f)])/(f*(d*e + (I - c)*f)*(1 + m)*(2 + m)) - ((I/2)*b*d*(e + f*x)^(2 + m)*
Hypergeometric2F1[1, 2 + m, 3 + m, (d*(e + f*x))/(d*e - (I + c)*f)])/(f*(d*
e - (I + c)*f)*(1 + m)*(2 + m))
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4863

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcCot[c*x]))/(e*(q + 1)), x] + Dist[(b*
```

```
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 712

```
Int[((d_) + (e_.)*(x_))^(m_)/((a_) + (c_.)*(x_)^2), x_Symbol] :> Int[Expand
Integrand[(d + e*x)^m, 1/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e, m}, x] &
& NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[m]
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rubi steps

$$\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right) dx = \frac{\operatorname{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)^m \left(a+b\cot^{-1}(x)\right) dx, x, c+dx\right)}{d}$$

$$= \frac{(e+fx)^{1+m}\left(a+b\cot^{-1}(c+dx)\right)}{f(1+m)} + \frac{b\operatorname{Subst}\left(\int \frac{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^{1+m}}{1+x^2} dx, x, c+dx\right)}{f(1+m)}$$

$$= \frac{(e+fx)^{1+m}\left(a+b\cot^{-1}(c+dx)\right)}{f(1+m)} + \frac{b\operatorname{Subst}\left(\int \left(\frac{i\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^{1+m}}{2(i-x)} + \frac{i\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^{1+m}}{2(i+x)}\right) d\right.}{f(1+m)}$$

$$= \frac{(e+fx)^{1+m}\left(a+b\cot^{-1}(c+dx)\right)}{f(1+m)} + \frac{(ib)\operatorname{Subst}\left(\int \frac{\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^{1+m}}{i-x} dx, x, c+dx\right)}{2f(1+m)} + \cdots$$

$$= \frac{(e+fx)^{1+m}\left(a+b\cot^{-1}(c+dx)\right)}{f(1+m)} + \frac{ibd(e+fx)^{2+m}\,{}_2F_1\left(1,2+m;3+m;\frac{d(e+fx)}{de+if-cf}\right.}{2f(de+(i-c)f)(1+m)(2+m)}$$

Mathematica [A] time = 0.326997, size = 162, normalized size = 0.92

$$\frac{(e+fx)^{m+1}\left(2\left(a+b\cot^{-1}(c+dx)\right)+\frac{bd(e+fx)\left((de-(c+i)f)\,{}_2F_1\left(1,m+2;m+3;\frac{d(e+fx)}{de-(c-i)f}\right)+(-de+(c-i)f)\,{}_2F_1\left(1,m+2;m+3;\frac{d(e+fx)}{de-(c+i)f}\right)\right)}{(m+2)(icf-ide+f)(de-(c+i)f)}\right)}{2f(m+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^m*(a + b*ArcCot[c + d*x]),x]
```

```
[Out] ((e + f*x)^(1 + m)*(2*(a + b*ArcCot[c + d*x]) + (b*d*(e + f*x)*((d*e - (I +
 c)*f)*Hypergeometric2F1[1, 2 + m, 3 + m, (d*(e + f*x))/(d*e - (-I + c)*f)]
 + (-(d*e) + (-I + c)*f)*Hypergeometric2F1[1, 2 + m, 3 + m, (d*(e + f*x))/(
d*e - (I + c)*f)]))/(((-I)*d*e + f + I*c*f)*(d*e - (I + c)*f)*(2 + m))))/(2
*f*(1 + m))
```

Maple [F] time = 1.395, size = 0, normalized size = 0.

$$\int \left(fx+e\right)^{m} \left(a+b\,\mathrm{arccot}\left(dx+c\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^m*(a+b*arccot(d*x+c)),x)
```

```
[Out] int((f*x+e)^m*(a+b*arccot(d*x+c)),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b\,\mathrm{arccot}\left(dx+c\right)+a\right)\left(fx+e\right)^{m},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral((b*arccot(d*x + c) + a)*(f*x + e)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**m*(a+b*acot(d*x+c)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (b \operatorname{arccot}(dx + c) + a)(fx + e)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)*(f*x + e)^m, x)
```

3.147 $\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)^2 \, dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left((e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)^2,x\right)$$

```
[Out] Unintegrable[(e + f*x)^m*(a + b*ArcCot[c + d*x])^2, x]
```

Rubi [A] time = 0.0605398, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(e + f*x)^m*(a + b*ArcCot[c + d*x])^2,x]
```

```
[Out] Defer[Subst][Defer[Int][((d*e - c*f)/d + (f*x)/d)^m*(a + b*ArcCot[x])^2, x]
, x, c + d*x]/d
```

Rubi steps

$$\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)^2 \, dx = \frac{\text{Subst}\left(\int \left(\frac{de-cf}{d}+\frac{fx}{d}\right)^m \left(a+b\cot^{-1}(x)\right)^2 \, dx, x, c+dx\right)}{d}$$

Mathematica [A] time = 5.2142, size = 0, normalized size = 0.

$$\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(e + f*x)^m*(a + b*ArcCot[c + d*x])^2,x]
```

```
[Out] Integrate[(e + f*x)^m*(a + b*ArcCot[c + d*x])^2, x]
```

Maple [A] time = 1.3, size = 0, normalized size = 0.

$$\int \left(fx+e\right)^{m} \left(a+b\,\mathrm{arccot}\left(dx+c\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^m*(a+b*arccot(d*x+c))^2,x)
```

```
[Out] int((f*x+e)^m*(a+b*arccot(d*x+c))^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b^{2}\,\mathrm{arccot}\left(dx+c\right)^{2}+2\,ab\,\mathrm{arccot}\left(dx+c\right)+a^{2}\right)\left(fx+e\right)^{m},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arccot(d*x + c)^2 + 2*a*b*arccot(d*x + c) + a^2)*(f*x + e)^m,
 x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**m*(a+b*acot(d*x+c))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int (b \operatorname{arccot}(dx + c) + a)^2 (fx + e)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^2*(f*x + e)^m, x)
```

3.148 $\int (e+fx)^m \left(a+b\cot^{-1}(c+dx)\right)^3\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left((e+fx)^m\left(a+b\cot^{-1}(c+dx)\right)^3,x\right)$$

```
[Out] Unintegrable[(e + f*x)^m*(a + b*ArcCot[c + d*x])^3, x]
```

Rubi [A] time = 0.0598165, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int (e+fx)^m\left(a+b\cot^{-1}(c+dx)\right)^3\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(e + f*x)^m*(a + b*ArcCot[c + d*x])^3,x]
```

```
[Out] Defer[Subst][Defer[Int][((d*e - c*f)/d + (f*x)/d)^m*(a + b*ArcCot[x])^3, x]
, x, c + d*x]/d
```

Rubi steps

$$\int (e+fx)^m\left(a+b\cot^{-1}(c+dx)\right)^3\,dx = \frac{\text{Subst}\left(\int\left(\frac{de-cf}{d}+\frac{fx}{d}\right)^m\left(a+b\cot^{-1}(x)\right)^3\,dx,x,c+dx\right)}{d}$$

Mathematica [A] time = 0.473046, size = 0, normalized size = 0.

$$\int (e+fx)^m\left(a+b\cot^{-1}(c+dx)\right)^3\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(e + f*x)^m*(a + b*ArcCot[c + d*x])^3,x]
```

```
[Out] Integrate[(e + f*x)^m*(a + b*ArcCot[c + d*x])^3, x]
```

Maple [A] time = 1.349, size = 0, normalized size = 0.

$$\int \left(fx+e\right)^{m} \left(a+b\,\mathrm{arccot}\left(dx+c\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^m*(a+b*arccot(d*x+c))^3,x)
```

```
[Out] int((f*x+e)^m*(a+b*arccot(d*x+c))^3,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\left(b^{3}\,\mathrm{arccot}\left(dx+c\right)^{3}+3\,ab^{2}\,\mathrm{arccot}\left(dx+c\right)^{2}+3\,a^{2}b\,\mathrm{arccot}\left(dx+c\right)+a^{3}\right)\left(fx+e\right)^{m},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*arccot(d*x + c)^3 + 3*a*b^2*arccot(d*x + c)^2 + 3*a^2*b*arcco
t(d*x + c) + a^3)*(f*x + e)^m, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**m*(a+b*acot(d*x+c))**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int (b \operatorname{arccot}(dx+c)+a)^3 (fx+e)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^m*(a+b*arccot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(d*x + c) + a)^3*(f*x + e)^m, x)
```

3.149 $\int x^3 \cot^{-1}\left(a+bx^4\right) dx$

Optimal. Leaf size=42

$$\frac{\log\left(\left(a+bx^4\right)^2+1\right)}{8b}+\frac{\left(a+bx^4\right)\cot^{-1}\left(a+bx^4\right)}{4b}$$

```
[Out] ((a + b*x^4)*ArcCot[a + b*x^4])/(4*b) + Log[1 + (a + b*x^4)^2]/(8*b)
```

Rubi [A] time = 0.0435711, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {6715, 5040, 4847, 260}

$$\frac{\log\left(\left(a+bx^4\right)^2+1\right)}{8b}+\frac{\left(a+bx^4\right)\cot^{-1}\left(a+bx^4\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcCot[a + b*x^4],x]
```

```
[Out] ((a + b*x^4)*ArcCot[a + b*x^4])/(4*b) + Log[1 + (a + b*x^4)^2]/(8*b)
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rule 5040

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d},
x] && IGtQ[p, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int x^3 \cot^{-1}\left(a+bx^4\right) dx &= \frac{1}{4}\operatorname{Subst}\left(\int \cot^{-1}(a+bx)\,dx, x, x^4\right)\\ &= \frac{\operatorname{Subst}\left(\int \cot^{-1}(x)\,dx, x, a+bx^4\right)}{4b}\\ &= \frac{\left(a+bx^4\right)\cot^{-1}\left(a+bx^4\right)}{4b}+\frac{\operatorname{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a+bx^4\right)}{4b}\\ &= \frac{\left(a+bx^4\right)\cot^{-1}\left(a+bx^4\right)}{4b}+\frac{\log\left(1+\left(a+bx^4\right)^2\right)}{8b}\end{aligned}$$

Mathematica [A] time = 0.0160148, size = 37, normalized size = 0.88

$$\frac{\log\left(\left(a+bx^4\right)^2+1\right)+2\left(a+bx^4\right)\cot^{-1}\left(a+bx^4\right)}{8b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*ArcCot[a + b*x^4],x]
```

```
[Out] (2*(a + b*x^4)*ArcCot[a + b*x^4] + Log[1 + (a + b*x^4)^2])/(8*b)
```

Maple [A] time = 0.039, size = 46, normalized size = 1.1

$$\frac{\operatorname{arccot}\left(bx^4+a\right)x^4}{4}+\frac{\operatorname{arccot}\left(bx^4+a\right)a}{4\,b}+\frac{\ln\left(1+\left(bx^4+a\right)^2\right)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arccot(b*x^4+a),x)
```

```
[Out] 1/4*arccot(b*x^4+a)*x^4+1/4/b*arccot(b*x^4+a)*a+1/8*ln(1+(b*x^4+a)^2)/b
```

Maxima [A] time = 0.973675, size = 47, normalized size = 1.12

$$\frac{2\left(bx^4+a\right)\operatorname{arccot}\left(bx^4+a\right)+\log\left(\left(bx^4+a\right)^2+1\right)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(b*x^4+a),x, algorithm="maxima")
```

```
[Out] 1/8*(2*(b*x^4 + a)*arccot(b*x^4 + a) + log((b*x^4 + a)^2 + 1))/b
```

Fricas [A] time = 2.5196, size = 130, normalized size = 3.1

$$\frac{2\,bx^4\operatorname{arccot}\left(bx^4+a\right)-2\,a\arctan\left(bx^4+a\right)+\log\left(b^2x^8+2\,abx^4+a^2+1\right)}{8\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(b*x^4+a),x, algorithm="fricas")
```

```
[Out] 1/8*(2*b*x^4*arccot(b*x^4 + a) - 2*a*arctan(b*x^4 + a) + log(b^2*x^8 + 2*a*
b*x^4 + a^2 + 1))/b
```

Sympy [A] time = 5.6283, size = 60, normalized size = 1.43

$$\begin{cases}\frac{a\operatorname{acot}\left(a+bx^4\right)}{4b}+\frac{x^4\operatorname{acot}\left(a+bx^4\right)}{4}+\frac{\log\left(a^2+2abx^4+b^2x^8+1\right)}{8b} & \text{for}\; b\neq 0\\ \frac{x^4\operatorname{acot}(a)}{4} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*acot(b*x**4+a),x)
```

```
[Out] Piecewise((a*acot(a + b*x**4)/(4*b) + x**4*acot(a + b*x**4)/4 + log(a**2 +
2*a*b*x**4 + b**2*x**8 + 1)/(8*b), Ne(b, 0)), (x**4*acot(a)/4, True))
```

Giac [A] time = 1.09646, size = 80, normalized size = 1.9

$$\frac{1}{4}x^4\arctan\left(\frac{1}{bx^4+a}\right)-\frac{1}{8}b\left(\frac{2a\arctan\left(bx^4+a\right)}{b^2}-\frac{\log\left(b^2x^8+2abx^4+a^2+1\right)}{b^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arccot(b*x^4+a),x, algorithm="giac")
```

```
[Out] 1/4*x^4*arctan(1/(b*x^4 + a)) - 1/8*b*(2*a*arctan(b*x^4 + a)/b^2 - log(b^2*
x^8 + 2*a*b*x^4 + a^2 + 1)/b^2)
```

3.150 $\int x^{-1+n} \cot^{-1}(a + bx^n) \, dx$

Optimal. Leaf size=45

$$\frac{\log\left((a+bx^n)^2+1\right)}{2bn}+\frac{(a+bx^n)\cot^{-1}(a+bx^n)}{bn}$$

```
[Out] ((a + b*x^n)*ArcCot[a + b*x^n])/(b*n) + Log[1 + (a + b*x^n)^2]/(2*b*n)
```

Rubi [A] time = 0.0444314, antiderivative size = 45, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {6715, 5040, 4847, 260}

$$\frac{\log\left((a+bx^n)^2+1\right)}{2bn}+\frac{(a+bx^n)\cot^{-1}(a+bx^n)}{bn}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-1 + n)*ArcCot[a + b*x^n],x]
```

```
[Out] ((a + b*x^n)*ArcCot[a + b*x^n])/(b*n) + Log[1 + (a + b*x^n)^2]/(2*b*n)
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rule 5040

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Dist[1/d,
 Subst[Int[(a + b*ArcCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d},
x] && IGtQ[p, 0]
```

Rule 4847

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cCot[c*x])^p, x] + Dist[b*c*p, Int[(x*(a + b*ArcCot[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int x^{-1+n}\cot^{-1}(a+bx^n)\,dx &= \frac{\text{Subst}\left(\int \cot^{-1}(a+bx)\,dx, x, x^n\right)}{n}\\ &= \frac{\text{Subst}\left(\int \cot^{-1}(x)\,dx, x, a+bx^n\right)}{bn}\\ &= \frac{(a+bx^n)\cot^{-1}(a+bx^n)}{bn} + \frac{\text{Subst}\left(\int \frac{x}{1+x^2}\,dx, x, a+bx^n\right)}{bn}\\ &= \frac{(a+bx^n)\cot^{-1}(a+bx^n)}{bn} + \frac{\log\left(1+(a+bx^n)^2\right)}{2bn}\end{aligned}$$

Mathematica [A] time = 0.0348946, size = 40, normalized size = 0.89

$$\frac{\log\left((a+bx^n)^2+1\right)+2(a+bx^n)\cot^{-1}(a+bx^n)}{2bn}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^(-1 + n)*ArcCot[a + b*x^n],x]
```

```
[Out] (2*(a + b*x^n)*ArcCot[a + b*x^n] + Log[1 + (a + b*x^n)^2])/(2*b*n)
```

Maple [C] time = 0.215, size = 149, normalized size = 3.3

$$\frac{\frac{i}{2}x^n\ln(1+i(a+bx^n))}{n} - \frac{\frac{i}{2}x^n\ln(1-i(a+bx^n))}{n} - \frac{\frac{i}{2}a}{bn}\ln\left(\frac{i+a}{b}+x^n\right) + \frac{\frac{i}{2}a}{bn}\ln\left(x^n-\frac{i-a}{b}\right) + \frac{\pi x^n}{2n} + \frac{1}{2bn}\ln\left(\frac{i+a}{b}+x^n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(n-1)*arccot(a+b*x^n),x)
```

```
[Out] 1/2*I/n*x^n*ln(1+I*(a+b*x^n))-1/2*I/n*x^n*ln(1-I*(a+b*x^n))-1/2*I/b/n*ln((I
+a)/b+x^n)*a+1/2*I/b/n*ln(x^n-(I-a)/b)*a+1/2/n*Pi*x^n+1/2/b/n*ln((I+a)/b+x^
n)+1/2/b/n*ln(x^n-(I-a)/b)
```

Maxima [A] time = 0.962616, size = 51, normalized size = 1.13

$$\frac{2\,(bx^n + a)\,\mathrm{arccot}\,(bx^n + a) + \log\left((bx^n + a)^2 + 1\right)}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*arccot(a+b*x^n),x, algorithm="maxima")
```

```
[Out] 1/2*(2*(b*x^n + a)*arccot(b*x^n + a) + log((b*x^n + a)^2 + 1))/(b*n)
```

Fricas [A] time = 2.71834, size = 140, normalized size = 3.11

$$\frac{2\,bx^n\,\mathrm{arccot}\,(bx^n + a) - 2\,a\arctan\,(bx^n + a) + \log\left(b^2x^{2\,n} + 2\,abx^n + a^2 + 1\right)}{2\,bn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*arccot(a+b*x^n),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x^n*arccot(b*x^n + a) - 2*a*arctan(b*x^n + a) + log(b^2*x^(2*n) +
2*a*b*x^n + a^2 + 1))/(b*n)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-1+n)*acot(a+b*x**n),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.10714, size = 88, normalized size = 1.96

$$-\frac{b\left(\frac{2\,a\arctan(bx^n+a)}{b^2} - \frac{\log\left(b^2x^{2\,n}+2\,abx^n+a^2+1\right)}{b^2}\right) - 2\,x^n\arctan\left(\frac{1}{bx^n+a}\right)}{2\,n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*arccot(a+b*x^n),x, algorithm="giac")
```

```
[Out] -1/2*(b*(2*a*arctan(b*x^n + a)/b^2 - log(b^2*x^(2*n) + 2*a*b*x^n + a^2 + 1)
/b^2) - 2*x^n*arctan(1/(b*x^n + a)))/n
```

3.151 $\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$

Optimal. Leaf size=42

$$\text{Unintegrable}\left(\frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^n}{1-c^2x^2},x\right)$$

```
[Out] Unintegrable[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2), x
]
```

Rubi [A] time = 0.0458797, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2),x]
```

```
[Out] Defer[Int][(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2), x]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx=\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$$

Mathematica [A] time = 0.0934448, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^n}{1-c^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2),x]
```

```
[Out] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^n/(1 - c^2*x^2), x]
```

Maple [A] time = 1.185, size = 0, normalized size = 0.

$$\int \frac{1}{-c^2x^2+1}\left(a+b\,\mathrm{arccot}\left(\sqrt{-cx+1}\,\frac{1}{\sqrt{cx+1}}\right)\right)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

```
[Out] int((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{\left(b\,\mathrm{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, algo
rithm="maxima")
```

```
[Out] -integrate((b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(-\frac{\left(b\,\mathrm{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)^n}{c^2x^2-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, algo
rithm="fricas")
```

```
[Out] integral(-(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{\left(a + b\operatorname{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)\right)^{n}}{c^{2}x^{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**n/(-c**2*x**2+1),x)
```

```
[Out] -Integral((a + b*acot(sqrt(-c*x + 1)/sqrt(c*x + 1)))**n/(c**2*x**2 - 1), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(b\operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a\right)^{n}}{c^{2}x^{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^n/(-c^2*x^2+1),x, algo
rithm="giac")
```

```
[Out] integrate(-(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^n/(c^2*x^2 - 1), x)
```

3.152 $\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$

Optimal. Leaf size=488

$$\frac{3b^2\text{PolyLog}\left(3,1-\frac{2i}{\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{2c}-\frac{3b^2\text{PolyLog}\left(3,1-\frac{2\sqrt{1-cx}}{\sqrt{cx+1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i\right)}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{2c}+\frac{3ib\text{Poly}}{}$$

```
[Out] (-2*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3*ArcCoth[1 - 2/(1 + (I*Sqr
t[1 - c*x])/Sqrt[1 + c*x])])/c + (((3*I)/2)*b*(a + b*ArcCot[Sqrt[1 - c*x]/S
qrt[1 + c*x]])^2*PolyLog[2, 1 - (2*I)/(I + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/c
 - (((3*I)/2)*b*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2*PolyLog[2, 1
- (2*Sqrt[1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/c +
 (3*b^2*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog[3, 1 - (2*I)/(I
 + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/(2*c) - (3*b^2*(a + b*ArcCot[Sqrt[1 - c*x
]/Sqrt[1 + c*x]])*PolyLog[3, 1 - (2*Sqrt[1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt
[1 - c*x]/Sqrt[1 + c*x]))])/(2*c) - (((3*I)/4)*b^3*PolyLog[4, 1 - (2*I)/(I
+ Sqrt[1 - c*x]/Sqrt[1 + c*x])])/c + (((3*I)/4)*b^3*PolyLog[4, 1 - (2*Sqrt[
1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/c
```

Rubi [A] time = 0.522737, antiderivative size = 488, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.175, Rules used = {6681, 4851, 4989, 4885, 4993, 4997, 6610}

$$\frac{3b^2\text{PolyLog}\left(3,1-\frac{2i}{\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{2c}-\frac{3b^2\text{PolyLog}\left(3,1-\frac{2\sqrt{1-cx}}{\sqrt{cx+1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i\right)}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{2c}+\frac{3ib\text{Poly}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2),x]
```

```
[Out] (-2*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3*ArcCoth[1 - 2/(1 + (I*Sqr
t[1 - c*x])/Sqrt[1 + c*x])])/c + (((3*I)/2)*b*(a + b*ArcCot[Sqrt[1 - c*x]/S
qrt[1 + c*x]])^2*PolyLog[2, 1 - (2*I)/(I + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/c
 - (((3*I)/2)*b*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2*PolyLog[2, 1
- (2*Sqrt[1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/c +
 (3*b^2*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog[3, 1 - (2*I)/(I
```

```
 + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/(2*c) - (3*b^2*(a + b*ArcCot[Sqrt[1 - c*x
]/Sqrt[1 + c*x]])*PolyLog[3, 1 - (2*Sqrt[1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt
[1 - c*x]/Sqrt[1 + c*x]))])/(2*c) - (((3*I)/4)*b^3*PolyLog[4, 1 - (2*I)/(I
+ Sqrt[1 - c*x]/Sqrt[1 + c*x])])/c + (((3*I)/4)*b^3*PolyLog[4, 1 - (2*Sqrt[
1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/c
```

Rule 6681

```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]], x
] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] && E
qQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rule 4851

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcCot[c*x])^p*ArcCoth[1 - 2/(1 + I*c*x)], x] + Dist[2*b*c*p, Int[((a + b
*ArcCot[c*x])^(p - 1)*ArcCoth[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4989

```
Int[(ArcCoth[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[SimplifyIntegrand[1 + 1/u, x]]*(a +
b*ArcCot[c*x])^p)/(d + e*x^2), x], x] - Dist[1/2, Int[(Log[SimplifyIntegran
d[1 - 1/u, x]]*(a + b*ArcCot[c*x])^p)/(d + e*x^2), x], x] /; FreeQ[{a, b, c
, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x
))^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4993

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] + Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4997

```
Int[(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^3}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} - \frac{(6b)\,\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^2\coth^{-1}\left(1-\frac{2}{1+ix}\right.}{1+x^2}\right.}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{(3b)\,\text{Subst}\left(\int \frac{\left(a+b\cot^{-1}(x)\right)^2\log\left(\frac{2i}{i+x}\right)}{1+x^2}\,dx,\right.}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{3ib\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{Li}_2\left(1-\frac{2}{i+\ldots}\right.}{2c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{3ib\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{Li}_2\left(1-\frac{2}{i+\ldots}\right.}{2c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{3ib\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\text{Li}_2\left(1-\frac{2}{i+\ldots}\right.}{2c}$$

Mathematica [F] time = 0.292622, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^3}{1-c^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2),x]
```

```
[Out] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^3/(1 - c^2*x^2), x]
```

Maple [B] time = 2.868, size = 1717, normalized size = 3.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x)
```

```
[Out] -6*I*a*b^2/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(2,(I+(-c*x+1)^(1/
2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-6*I*a*b^2/c*arccot((-c*x+1)^(
1/2)/(c*x+1)^(1/2))*polylog(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(
c*x+1)+1)^(1/2))+3*I*a*b^2/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(2
,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))-1/2*a^3/c*ln(c*x
-1)+1/2*a^3/c*ln(c*x+1)+b^3/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^3*ln(1-(
I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+6*b^3/c*arccot(
(-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(3,(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((
-c*x+1)/(c*x+1)+1)^(1/2))+b^3/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^3*ln(1
+(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+6*b^3/c*arcco
t((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(3,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))
/((-c*x+1)/(c*x+1)+1)^(1/2))-b^3/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^3*l
n((I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1)+1)-3/2*b^3/c*arcc
ot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(3,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2)
)^2/((-c*x+1)/(c*x+1)+1))+6*I*b^3/c*polylog(4,(I+(-c*x+1)^(1/2)/(c*x+1)^(1/
2))/((-c*x+1)/(c*x+1)+1)^(1/2))+6*I*b^3/c*polylog(4,-(I+(-c*x+1)^(1/2)/(c*x
+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-3/4*I*b^3/c*polylog(4,-(I+(-c*x+1)^(
1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))+6*a*b^2/c*polylog(3,(I+(-c*x+1)
^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+6*a*b^2/c*polylog(3,-(I+(
-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-3/2*a*b^2/c*polylo
g(3,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))+3/2*I*b^3/c*a
rccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*polylog(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^
```

```
(1/2))^2/((-c*x+1)/(c*x+1)+1))-3*I*b^3/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2
))^2*polylog(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2)
)+3*a^2*b/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(1+(I+(-c*x+1)^(1/2)/(c*
x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+3*a^2*b/c*arccot((-c*x+1)^(1/2)/(c*
x+1)^(1/2))*ln(1-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2
))-3*a^2*b/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln((I+(-c*x+1)^(1/2)/(c*x
+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1)+1)-3*I*a^2*b/c*polylog(2,-(I+(-c*x+1)^(1/
2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-3*I*a^2*b/c*polylog(2,(I+(-c*
x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+3/2*I*a^2*b/c*polylog
(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))+3*a*b^2/c*arcc
ot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln(1-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((
-c*x+1)/(c*x+1)+1)^(1/2))+3*a*b^2/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*
ln(1+(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-3*a*b^2/c
*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln((I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))
^2/((-c*x+1)/(c*x+1)+1)+1)-3*I*b^3/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2
*polylog(2,(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^3\left(\frac{\log(cx+1)}{c}-\frac{\log(cx-1)}{c}\right)+\frac{\frac{15}{2}\left(b^3\log(cx+1)-b^3\log(-cx+1)\right)\arctan\left(\sqrt{cx+1},\sqrt{-cx+1}\right)^3-\frac{45}{8}\left(b^3\log(2)^2\,\mathrm{l}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, algo
rithm="maxima")
```

```
[Out] 1/2*a^3*(log(c*x + 1)/c - log(c*x - 1)/c) + 1/64*(4*(b^3*log(c*x + 1) - b^3
*log(-c*x + 1))*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1))^3 - 3*(b^3*log(2)^2*
log(c*x + 1) - b^3*log(2)^2*log(-c*x + 1))*arctan2(sqrt(c*x + 1), sqrt(-c*x
 + 1)) + 64*c*integrate(-1/128*(112*b^3*arctan2(sqrt(c*x + 1), sqrt(-c*x +
1))^3 + 384*a*b^2*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1))^2 + 3*(b^3*log(2)^
2*log(c*x + 1) - b^3*log(2)^2*log(-c*x + 1) - 4*(b^3*log(c*x + 1) - b^3*log
(-c*x + 1))*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1))^2)*sqrt(c*x + 1)*sqrt(-c
*x + 1) + 12*(b^3*log(2)^2 + 32*a^2*b)*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1
)))/(c^2*x^2 - 1), x))/c
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^3 \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3 + 3\,ab^2 \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2 + 3\,a^2b \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a^3}{c^2x^2 - 1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, algo
rithm="fricas")
```

```
[Out] integral(-(b^3*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1))^3 + 3*a*b^2*arccot(sqrt
(-c*x + 1)/sqrt(c*x + 1))^2 + 3*a^2*b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1))
+ a^3)/(c^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{a^3}{c^2x^2 - 1}\,dx - \int \frac{b^3 \operatorname{acot}^3\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}{c^2x^2 - 1}\,dx - \int \frac{3ab^2 \operatorname{acot}^2\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}{c^2x^2 - 1}\,dx - \int \frac{3a^2b \operatorname{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}{c^2x^2 - 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**3/(-c**2*x**2+1),x)
```

```
[Out] -Integral(a**3/(c**2*x**2 - 1), x) - Integral(b**3*acot(sqrt(-c*x + 1)/sqrt
(c*x + 1))**3/(c**2*x**2 - 1), x) - Integral(3*a*b**2*acot(sqrt(-c*x + 1)/s
qrt(c*x + 1))**2/(c**2*x**2 - 1), x) - Integral(3*a**2*b*acot(sqrt(-c*x + 1
)/sqrt(c*x + 1))/(c**2*x**2 - 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(b \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a\right)^3}{c^2x^2 - 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^3/(-c^2*x^2+1),x, algo
rithm="giac")
```

```
[Out] integrate(-(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^3/(c^2*x^2 - 1), x)
```

3.153 $\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$

Optimal. Leaf size=321

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2i}{\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{c}-\frac{ib\text{PolyLog}\left(2,1-\frac{2\sqrt{1-cx}}{\sqrt{cx+1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i\right)}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{c}+\frac{b^2\text{PolyL}}{}$$

```
[Out] (-2*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2*ArcCoth[1 - 2/(1 + (I*Sqr
t[1 - c*x])/Sqrt[1 + c*x])])/c + (I*b*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 +
c*x]])*PolyLog[2, 1 - (2*I)/(I + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/c - (I*b*(a
 + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog[2, 1 - (2*Sqrt[1 - c*x])/
(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/c + (b^2*PolyLog[3, 1 -
 (2*I)/(I + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/(2*c) - (b^2*PolyLog[3, 1 - (2*S
qrt[1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/(2*c)
```

Rubi [A] time = 0.319821, antiderivative size = 321, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {6681, 4851, 4989, 4885, 4993, 6610}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2i}{\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{c}-\frac{ib\text{PolyLog}\left(2,1-\frac{2\sqrt{1-cx}}{\sqrt{cx+1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}+i\right)}\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)}{c}+\frac{b^2\text{PolyL}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2),x]
```


```
[Out] (-2*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2*ArcCoth[1 - 2/(1 + (I*Sqr
t[1 - c*x])/Sqrt[1 + c*x])])/c + (I*b*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 +
c*x]])*PolyLog[2, 1 - (2*I)/(I + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/c - (I*b*(a
 + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])*PolyLog[2, 1 - (2*Sqrt[1 - c*x])/
(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/c + (b^2*PolyLog[3, 1 -
 (2*I)/(I + Sqrt[1 - c*x]/Sqrt[1 + c*x])])/(2*c) - (b^2*PolyLog[3, 1 - (2*S
qrt[1 - c*x])/(Sqrt[1 + c*x]*(I + Sqrt[1 - c*x]/Sqrt[1 + c*x]))])/(2*c)
```


Rule 6681

```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]], x
] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] && E
qQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rule 4851

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcCot[c*x])^p*ArcCoth[1 - 2/(1 + I*c*x)], x] + Dist[2*b*c*p, Int[((a + b
*ArcCot[c*x])^(p - 1)*ArcCoth[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4989

```
Int[(ArcCoth[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[SimplifyIntegrand[1 + 1/u, x]]*(a +
b*ArcCot[c*x])^p)/(d + e*x^2), x], x] - Dist[1/2, Int[(Log[SimplifyIntegran
d[1 - 1/u, x]]*(a + b*ArcCot[c*x])^p)/(d + e*x^2), x], x] /; FreeQ[{a, b, c
, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x
))^2, 0]
```

Rule 4885

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> -Simp[(a + b*ArcCot[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
 c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4993

```
Int[(Log[u_]*((a_.) + ArcCot[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcCot[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] + Dist[(b*p*I)/2, Int[((a + b*ArcCot[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx = -\frac{\text{Subst}\left(\int \frac{(a+b\cot^{-1}(x))^2}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} - \frac{(4b)\,\text{Subst}\left(\int \frac{(a+b\cot^{-1}(x))\coth^{-1}\left(1-\frac{2}{1+\cdots}\right)}{1+x^2}\cdots\right)}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{(2b)\,\text{Subst}\left(\int \frac{(a+b\cot^{-1}(x))\log\left(\frac{2i}{i+x}\right)}{1+x^2}\,dx,\cdots\right)}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{ib\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\text{Li}_2\left(1-\frac{2}{i+\frac{\sqrt{\cdots}}{\sqrt{\cdots}}}\cdots\right)}{c}$$

$$= -\frac{2\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2\coth^{-1}\left(1-\frac{2}{1+\frac{i\sqrt{1-cx}}{\sqrt{1+cx}}}\right)}{c} + \frac{ib\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)\text{Li}_2\left(1-\frac{2}{i+\frac{\sqrt{\cdots}}{\sqrt{\cdots}}}\cdots\right)}{c}$$

Mathematica [F] time = 0.535587, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}{1-c^2x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2),x]
```

```
[Out] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2/(1 - c^2*x^2), x]
```

Maple [B] time = 1.422, size = 931, normalized size = 2.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x)
```

```
[Out] 1/2*a^2/c*ln(c*x+1)-1/2*a^2/c*ln(c*x-1)+b^2/c*arccot((-c*x+1)^(1/2)/(c*x+1)
^(1/2))^2*ln(1-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))
+I*b^2/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(2,-(I+(-c*x+1)^(1/2)/
(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))+2*b^2/c*polylog(3,(I+(-c*x+1)^(1/2)/
(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+b^2/c*arccot((-c*x+1)^(1/2)/(c*x
+1)^(1/2))^2*ln(1+(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/
2))-2*I*a*b/c*polylog(2,(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+
1)^(1/2))+2*b^2/c*polylog(3,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*
x+1)+1)^(1/2))-b^2/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))^2*ln((I+(-c*x+1)^
(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1)+1)+I*a*b/c*polylog(2,-(I+(-c*x+
1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))-1/2*b^2/c*polylog(3,-(I+(-c
*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))+2*a*b/c*arccot((-c*x+1)^
(1/2)/(c*x+1)^(1/2))*ln(1+(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1
)+1)^(1/2))-2*I*a*b/c*polylog(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)
/(c*x+1)+1)^(1/2))+2*a*b/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(1-(I+(-c
*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-2*I*b^2/c*arccot((-c
*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(2,(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*
x+1)/(c*x+1)+1)^(1/2))-2*a*b/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln((I+(
-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1)+1)-2*I*b^2/c*arccot((-c
*x+1)^(1/2)/(c*x+1)^(1/2))*polylog(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c
*x+1)/(c*x+1)+1)^(1/2))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2\left(\frac{\log(cx+1)}{c}-\frac{\log(cx-1)}{c}\right)-\frac{b^2\log(2)^2\log(cx+1)-b^2\log(2)^2\log(-cx+1)-4\left(b^2\log(cx+1)-b^2\log(-cx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, algo
rithm="maxima")
```

```
[Out] 1/2*a^2*(log(c*x + 1)/c - log(c*x - 1)/c) - 1/32*(b^2*log(2)^2*log(c*x + 1)
 - b^2*log(2)^2*log(-c*x + 1) - 4*(b^2*log(c*x + 1) - b^2*log(-c*x + 1))*ar
ctan2(sqrt(c*x + 1), sqrt(-c*x + 1))^2 - (b^2*(log(c*x + 1)/c - log(c*x - 1
)/c)*log(2)^2 + 64*b^2*integrate(1/16*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan(s
qrt(c*x + 1)/sqrt(-c*x + 1))*log(c*x + 1)/(c^2*x^2 - 1), x) - 64*b^2*integr
ate(1/16*sqrt(c*x + 1)*sqrt(-c*x + 1)*arctan(sqrt(c*x + 1)/sqrt(-c*x + 1))*
```

```
log(-c*x + 1)/(c^2*x^2 - 1), x) - 384*b^2*integrate(1/16*arctan(sqrt(c*x +
1)/sqrt(-c*x + 1))^2/(c^2*x^2 - 1), x) - 1024*a*b*integrate(1/16*arctan(sqr
t(c*x + 1)/sqrt(-c*x + 1))/(c^2*x^2 - 1), x))*c)/c
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b^2\,\text{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2 + 2\,ab\,\text{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a^2}{c^2x^2-1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, algo
rithm="fricas")
```

```
[Out] integral(-(b^2*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1))^2 + 2*a*b*arccot(sqrt(-
c*x + 1)/sqrt(c*x + 1)) + a^2)/(c^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\int \frac{a^2}{c^2x^2-1}\,dx - \int \frac{b^2\,\text{acot}^2\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}{c^2x^2-1}\,dx - \int \frac{2ab\,\text{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}{c^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**2/(-c**2*x**2+1),x)
```

```
[Out] -Integral(a**2/(c**2*x**2 - 1), x) - Integral(b**2*acot(sqrt(-c*x + 1)/sqrt
(c*x + 1))**2/(c**2*x**2 - 1), x) - Integral(2*a*b*acot(sqrt(-c*x + 1)/sqrt
(c*x + 1))/(c**2*x**2 - 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\left(b\,\text{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a\right)^2}{c^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2/(-c^2*x^2+1),x, algo
rithm="giac")
```

```
[Out] integrate(-(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^2/(c^2*x^2 - 1), x)
```

3.154 $\int \frac{a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx$

Optimal. Leaf size=98

$$\frac{ib\text{PolyLog}\left(2,-\frac{i\sqrt{cx+1}}{\sqrt{1-cx}}\right)}{2c}-\frac{ib\text{PolyLog}\left(2,\frac{i\sqrt{cx+1}}{\sqrt{1-cx}}\right)}{2c}-\frac{a\log\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

```
[Out] -((a*Log[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/c) + ((I/2)*b*PolyLog[2, ((-I)*Sqrt[
1 + c*x])/Sqrt[1 - c*x]])/c - ((I/2)*b*PolyLog[2, (I*Sqrt[1 + c*x])/Sqrt[1
- c*x]])/c
```

Rubi [A] time = 0.0690427, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {206, 6681, 4849, 2391}

$$\frac{ib\text{PolyLog}\left(2,-\frac{i\sqrt{cx+1}}{\sqrt{1-cx}}\right)}{2c}-\frac{ib\text{PolyLog}\left(2,\frac{i\sqrt{cx+1}}{\sqrt{1-cx}}\right)}{2c}-\frac{a\log\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2),x]
```

```
[Out] -((a*Log[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/c) + ((I/2)*b*PolyLog[2, ((-I)*Sqrt[
1 + c*x])/Sqrt[1 - c*x]])/c - ((I/2)*b*PolyLog[2, (I*Sqrt[1 + c*x])/Sqrt[1
- c*x]])/c
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 6681

```
Int[((a_.) + (b_.)*(F_)[((c_.)*Sqrt[(d_.) + (e_.)*(x_)])/Sqrt[(f_.) + (g_.)
*(x_)]]])^(n_.)/((A_.) + (C_.)*(x_)^2), x_Symbol] :> Dist[(2*e*g)/(C*(e*f -
d*g)), Subst[Int[(a + b*F[c*x])^n/x, x], x, Sqrt[d + e*x]/Sqrt[f + g*x]], x
] /; FreeQ[{a, b, c, d, e, f, g, A, C, F}, x] && EqQ[C*d*f - A*e*g, 0] && E
```

```
qQ[e*f + d*g, 0] && IGtQ[n, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{1-c^2x^2}\,dx &= -\frac{\operatorname{Subst}\left(\int \frac{a+b\cot^{-1}(x)}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c}\\
&= -\frac{a\log\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c} - \frac{(ib)\operatorname{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{2c} + \frac{(ib)\operatorname{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x}\,dx, x, \frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{2c}\\
&= -\frac{a\log\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)}{c} + \frac{ib\operatorname{Li}_2\left(-\frac{i\sqrt{1+cx}}{\sqrt{1-cx}}\right)}{2c} - \frac{ib\operatorname{Li}_2\left(\frac{i\sqrt{1+cx}}{\sqrt{1-cx}}\right)}{2c}
\end{aligned}$$

Mathematica [A] time = 0.0361056, size = 93, normalized size = 0.95

$$-\frac{-\frac{1}{2}ib\operatorname{PolyLog}\left(2,-\frac{i\sqrt{cx+1}}{\sqrt{1-cx}}\right)+\frac{1}{2}ib\operatorname{PolyLog}\left(2,\frac{i\sqrt{cx+1}}{\sqrt{1-cx}}\right)+a\log\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)}{c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])/(1 - c^2*x^2),x]
```

```
[Out] -((a*Log[Sqrt[1 - c*x]/Sqrt[1 + c*x]] - (I/2)*b*PolyLog[2, ((-I)*Sqrt[1 + c
*x])/Sqrt[1 - c*x]] + (I/2)*b*PolyLog[2, (I*Sqrt[1 + c*x])/Sqrt[1 - c*x]])/
c)
```

Maple [B] time = 0.773, size = 364, normalized size = 3.7

$$\frac{a\ln\left(cx+1\right)}{2c}-\frac{a\ln\left(cx-1\right)}{2c}+\frac{b}{c}\mathrm{arccot}\left(\sqrt{-cx+1}\frac{1}{\sqrt{cx+1}}\right)\ln\left(1+\left(i+\sqrt{-cx+1}\frac{1}{\sqrt{cx+1}}\right)\frac{1}{\sqrt{\frac{-cx+1}{cx+1}+1}}\right)-\frac{ib}{c}\mathrm{polylog}\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x)
```

```
[Out] 1/2*a/c*ln(c*x+1)-1/2*a/c*ln(c*x-1)+b/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)
)*ln(1+(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))-I*b/c*p
olylog(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/((-c*x+1)/(c*x+1)+1)^(1/2))+b/c*
arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln(1-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))/
((-c*x+1)/(c*x+1)+1)^(1/2))-I*b/c*polylog(2,(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2)
)/((-c*x+1)/(c*x+1)+1)^(1/2))-b/c*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))*ln((
I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1)+1)+1/2*I*b/c*polylog
(2,-(I+(-c*x+1)^(1/2)/(c*x+1)^(1/2))^2/((-c*x+1)/(c*x+1)+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{\log\left(cx+1\right)}{c}-\frac{\log\left(cx-1\right)}{c}\right)+\frac{\left(\left(\log\left(cx+1\right)-\log\left(-cx+1\right)\right)\arctan\left(\sqrt{cx+1},\sqrt{-cx+1}\right)+c\int\frac{e^{\left(\frac{1}{2}\log(cx+1)+\frac{1}{2}\log(-cx+\right.}}{(c}\right.}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algori
thm="maxima")
```

```
[Out] 1/2*a*(log(c*x + 1)/c - log(c*x - 1)/c) + 1/2*((log(c*x + 1) - log(-c*x + 1
))*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1)) + 2*c*integrate(1/2*(e^(1/2*log(c
*x + 1) + 1/2*log(-c*x + 1))*log(c*x + 1) - e^(1/2*log(c*x + 1) + 1/2*log(-
c*x + 1))*log(-c*x + 1))/((c^2*x^2 - 1)*(c*x + 1) - (c^2*x^2 - 1)*(c*x - 1)
), x))*b/c
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\,\text{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algori
thm="fricas")
```

```
[Out] integral(-(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)/(c^2*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{a}{c^2x^2-1}\,dx-\int\frac{b\,\text{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}{c^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot((-c*x+1)**(1/2)/(c*x+1)**(1/2)))/(-c**2*x**2+1),x)
```

```
[Out] -Integral(a/(c**2*x**2 - 1), x) - Integral(b*acot(sqrt(-c*x + 1)/sqrt(c*x +
 1))/(c**2*x**2 - 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{b\,\text{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a}{c^2x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))/(-c^2*x^2+1),x, algori
thm="giac")
```

```
[Out] integrate(-(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)/(c^2*x^2 - 1), x)
```

3.155 $\int \frac{1}{\left(1-c^2x^2\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$

Optimal. Leaf size=42

$$\text{Unintegrable}\left(\frac{1}{\left(1-c^2x^2\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)},x\right)$$

```
[Out] Unintegrable[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),
 x]
```

Rubi [A] time = 0.0457182, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(1-c^2x^2\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])), x
]
```

Rubi steps

$$\int \frac{1}{\left(1-c^2x^2\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx=\int \frac{1}{\left(1-c^2x^2\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

Mathematica [A] time = 0.0934652, size = 0, normalized size = 0.

$$\int \frac{1}{\left(1-c^2x^2\right)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])),x]
```

```
[Out] Integrate[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])), x]
```

Maple [A] time = 1.186, size = 0, normalized size = 0.

$$\int \frac{1}{-c^2x^2+1}\left(a+b\operatorname{arccot}\left(\sqrt{-cx+1}\frac{1}{\sqrt{cx+1}}\right)\right)^{-1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

```
[Out] int(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{1}{\left(c^2x^2-1\right)\left(b\operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, algo
rithm="maxima")
```

```
[Out] -integrate(1/((c^2*x^2 - 1)*(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)),
x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{1}{ac^2x^2+\left(bc^2x^2-b\right)\operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)-a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, algo
rithm="fricas")
```

```
[Out] integral(-1/(a*c^2*x^2 + (b*c^2*x^2 - b)*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1
)) - a), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{1}{ac^2x^2 - a + bc^2x^2 \operatorname{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) - b \operatorname{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)/(a+b*acot((-c*x+1)**(1/2)/(c*x+1)**(1/2))),x)
```

```
[Out] -Integral(1/(a*c**2*x**2 - a + b*c**2*x**2*acot(sqrt(-c*x + 1)/sqrt(c*x + 1
)) - b*acot(sqrt(-c*x + 1)/sqrt(c*x + 1))), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{1}{\left(c^2x^2 - 1\right)\left(b \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a\right)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2))),x, algo
rithm="giac")
```

```
[Out] integrate(-1/((c^2*x^2 - 1)*(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)),
x)
```

3.156 $\int \frac{1}{(1-c^2x^2)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$

Optimal. Leaf size=42

$$\text{Unintegrable}\left(\frac{1}{(1-c^2x^2)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{cx+1}}\right)\right)^2},x\right)$$

```
[Out] Unintegrable[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2
), x]
```

Rubi [A] time = 0.0415443, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(1-c^2x^2)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),x]
```

```
[Out] Defer[Int][1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),
 x]
```

Rubi steps

$$\int \frac{1}{(1-c^2x^2)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx = \int \frac{1}{(1-c^2x^2)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$$

Mathematica [A] time = 0.824999, size = 0, normalized size = 0.

$$\int \frac{1}{(1-c^2x^2)\left(a+b\cot^{-1}\left(\frac{\sqrt{1-cx}}{\sqrt{1+cx}}\right)\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),x
]
```

```
[Out] Integrate[1/((1 - c^2*x^2)*(a + b*ArcCot[Sqrt[1 - c*x]/Sqrt[1 + c*x]])^2),
x]
```

Maple [A] time = 1.228, size = 0, normalized size = 0.

$$\int \frac{1}{-c^2x^2+1}\left(a+b\operatorname{arccot}\left(\sqrt{-cx+1}\frac{1}{\sqrt{cx+1}}\right)\right)^{-2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

```
[Out] int(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{2\left(\left(b^2c^2\arctan\left(\sqrt{cx+1},\sqrt{-cx+1}\right)+abc^2\right)\sqrt{cx+1}\sqrt{-cx+1}\int\frac{x}{\left(abc^2x^2-ab+\left(b^2c^2x^2-b^2\right)\arctan\left(\sqrt{cx+1},\sqrt{-cx+1}\right)\right)\sqrt{cx+1}\sqrt{-cx+1}}\,d}{\left(b^2c\arctan\left(\sqrt{cx+1},\sqrt{-cx+1}\right)+abc\right)\sqrt{cx+1}\sqrt{-cx+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, al
gorithm="maxima")
```

```
[Out] -2*(2*(b^2*c^2*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1)) + a*b*c^2)*sqrt(c*x +
 1)*sqrt(-c*x + 1)*integrate(1/2*x/((a*b*c^2*x^2 - a*b + (b^2*c^2*x^2 - b^2
)*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1)))*sqrt(c*x + 1)*sqrt(-c*x + 1)), x)
 + 1)/((b^2*c*arctan2(sqrt(c*x + 1), sqrt(-c*x + 1)) + a*b*c)*sqrt(c*x + 1)
*sqrt(-c*x + 1))
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{1}{a^2c^2x^2 + \left(b^2c^2x^2 - b^2\right)\operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^2 - a^2 + 2\left(abc^2x^2 - ab\right)\operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, al
gorithm="fricas")
```

```
[Out] integral(-1/(a^2*c^2*x^2 + (b^2*c^2*x^2 - b^2)*arccot(sqrt(-c*x + 1)/sqrt(c
*x + 1))^2 - a^2 + 2*(a*b*c^2*x^2 - a*b)*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1
))), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$-\int \frac{1}{a^2c^2x^2 - a^2 + 2abc^2x^2\operatorname{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) - 2ab\operatorname{acot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + b^2c^2x^2\operatorname{acot}^2\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) - b^2\operatorname{acot}^2\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c**2*x**2+1)/(a+b*acot((-c*x+1)**(1/2)/(c*x+1)**(1/2)))**2,x)
```

```
[Out] -Integral(1/(a**2*c**2*x**2 - a**2 + 2*a*b*c**2*x**2*acot(sqrt(-c*x + 1)/sq
rt(c*x + 1)) - 2*a*b*acot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + b**2*c**2*x**2*ac
ot(sqrt(-c*x + 1)/sqrt(c*x + 1))**2 - b**2*acot(sqrt(-c*x + 1)/sqrt(c*x + 1
))**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int -\frac{1}{\left(c^2x^2 - 1\right)\left(b\operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) + a\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(-c^2*x^2+1)/(a+b*arccot((-c*x+1)^(1/2)/(c*x+1)^(1/2)))^2,x, al
gorithm="giac")
```

```
[Out] integrate(-1/((c^2*x^2 - 1)*(b*arccot(sqrt(-c*x + 1)/sqrt(c*x + 1)) + a)^2)
, x)
```

3.157 $\int \cot^{-1}(\tan(a+bx))\,dx$

Optimal. Leaf size=16

$$-\frac{\cot^{-1}(\tan(a+bx))^2}{2b}$$

```
[Out] -ArcCot[Tan[a + b*x]]^2/(2*b)
```

Rubi [A] time = 0.0082204, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2157, 30}

$$-\frac{\cot^{-1}(\tan(a+bx))^2}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Tan[a + b*x]],x]
```

```
[Out] -ArcCot[Tan[a + b*x]]^2/(2*b)
```

Rule 2157

```
Int[(u_)^(m_.), x_Symbol] :> With[{c = Simplify[D[u, x]]}, Dist[1/c, Subst[
Int[x^m, x], x, u], x]] /; FreeQ[m, x] && PiecewiseLinearQ[u, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \cot^{-1}(\tan(a+bx))\,dx &= -\frac{\text{Subst}\left(\int x\,dx, x, \cot^{-1}(\tan(a+bx))\right)}{b}\\ &= -\frac{\cot^{-1}(\tan(a+bx))^2}{2b}\end{aligned}$$

Mathematica [A] time = 0.0053343, size = 18, normalized size = 1.12

$$x\cot^{-1}(\tan(a+bx))+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Tan[a + b*x]],x]
```

```
[Out] (b*x^2)/2 + x*ArcCot[Tan[a + b*x]]
```

Maple [A] time = 0.042, size = 20, normalized size = 1.3

$$\frac{\pi x}{2}-\frac{(\arctan(\tan(bx+a)))^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/2*Pi-arctan(tan(b*x+a)),x)
```

```
[Out] 1/2*Pi*x-1/2/b*arctan(tan(b*x+a))^2
```

Maxima [A] time = 0.975565, size = 23, normalized size = 1.44

$$\frac{1}{2}\pi x-\frac{(bx+a)^2}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*pi-arctan(tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*pi*x - 1/2*(b*x + a)^2/b
```

Fricas [A] time = 2.35328, size = 42, normalized size = 2.62

$$-\frac{1}{2}bx^2+\frac{1}{2}(\pi-2a)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*pi-arctan(tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] -1/2*b*x^2 + 1/2*(pi - 2*a)*x
```

Sympy [B] time = 0.167083, size = 48, normalized size = 3.

$$\frac{\pi x}{2} - \begin{cases} \frac{\left(\operatorname{atan}\left(\tan\left(a+bx\right)\right)+\pi\left\lfloor\frac{a+bx-\frac{\pi}{2}}{\pi}\right\rfloor\right)^2}{2b} & \text{for } b \neq 0 \\ x\left(\operatorname{atan}\left(\tan\left(a\right)\right) + \pi\left\lfloor\frac{a-\frac{\pi}{2}}{\pi}\right\rfloor\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*pi-atan(tan(b*x+a)),x)
```

```
[Out] pi*x/2 - Piecewise(((atan(tan(a + b*x)) + pi*floor((a + b*x - pi/2)/pi))**2
/(2*b), Ne(b, 0)), (x*(atan(tan(a)) + pi*floor((a - pi/2)/pi)), True))
```

Giac [A] time = 1.12254, size = 41, normalized size = 2.56

$$-\frac{1}{2}\,bx^2 + \pi x\left\lfloor\frac{bx+a}{\pi} + \frac{1}{2}\right\rfloor + \frac{1}{2}\,\pi x - ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/2*pi-arctan(tan(b*x+a)),x, algorithm="giac")
```

```
[Out] -1/2*b*x^2 + pi*x*floor((b*x + a)/pi + 1/2) + 1/2*pi*x - a*x
```

3.158 $\int x^2 \cot^{-1}(c + d\tan(a + bx))\,dx$

Optimal. Leaf size=403

$$-\frac{ix\text{PolyLog}\left(3,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{4b^2}+\frac{ix\text{PolyLog}\left(3,-\frac{(c+i(1-d))e^{2ia+2ibx}}{c+i(d+1)}\right)}{4b^2}+\frac{\text{PolyLog}\left(4,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{8b^3}-\frac{\text{PolyLog}\left(4,-\right.}{8b}$$

```
[Out] (x^3*ArcCot[c + d*Tan[a + b*x]])/3 - (I/6)*x^3*Log[1 + ((1 + I*c + d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c - d)] + (I/6)*x^3*Log[1 + ((c + I*(1 - d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 + d))] - (x^2*PolyLog[2, -(((1 + I*c + d)*E
^((2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/(4*b) + (x^2*PolyLog[2, -(((c + I*
(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d)))])/(4*b) - ((I/4)*x*PolyL
og[3, -(((1 + I*c + d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/b^2 + ((I/
4)*x*PolyLog[3, -(((c + I*(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d))
)])/b^2 + PolyLog[4, -(((1 + I*c + d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c - d
))]/(8*b^3) - PolyLog[4, -(((c + I*(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I
*(1 + d)))]/(8*b^3)
```

Rubi [A] time = 0.511602, antiderivative size = 403, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5176, 2190, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{4b^2}+\frac{ix\text{PolyLog}\left(3,-\frac{(c+i(1-d))e^{2ia+2ibx}}{c+i(d+1)}\right)}{4b^2}+\frac{\text{PolyLog}\left(4,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{8b^3}-\frac{\text{PolyLog}\left(4,-\right.}{8b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + d*Tan[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + d*Tan[a + b*x]])/3 - (I/6)*x^3*Log[1 + ((1 + I*c + d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c - d)] + (I/6)*x^3*Log[1 + ((c + I*(1 - d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 + d))] - (x^2*PolyLog[2, -(((1 + I*c + d)*E
^((2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/(4*b) + (x^2*PolyLog[2, -(((c + I*
(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d)))])/(4*b) - ((I/4)*x*PolyL
og[3, -(((1 + I*c + d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/b^2 + ((I/
4)*x*PolyLog[3, -(((c + I*(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d))
)])/b^2 + PolyLog[4, -(((1 + I*c + d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c - d
))]/(8*b^3) - PolyLog[4, -(((c + I*(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I
*(1 + d)))]/(8*b^3)
```

Rule 5176

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tan[a + b*x]])/(f*(m +
 1)), x] + (-Dist[(b*(1 - I*c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(
2*I*a + 2*I*b*x))/(1 - I*c + d + (1 - I*c - d)*E^(2*I*a + 2*I*b*x)), x], x]
 + Dist[(b*(1 + I*c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*I*a + 2*
I*b*x))/(1 + I*c - d + (1 + I*c + d)*E^(2*I*a + 2*I*b*x)), x], x]) /; FreeQ
[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && NeQ[(c + I*d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
```

```
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2\cot^{-1}(c+d\tan(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{3}(b(1-ic-d))\int \frac{e^{2ia+2ibx}x^3}{1-ic+d+(1-ic-d)e^{2ia+2ibx}}\,d$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

Mathematica [A] time = 0.810433, size = 363, normalized size = 0.9

$$\frac{1}{3}x^3\cot^{-1}(d\tan(a+bx)+c) + \frac{-6b^2x^2\text{PolyLog}\left(2,-\frac{(c-i(d+1))e^{2i(a+bx)}}{c+i(d-1)}\right) + 6b^2x^2\text{PolyLog}\left(2,-\frac{(c-id+i)e^{2i(a+bx)}}{c+i(d+1)}\right) - 6ibx\text{PolyL}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + d*Tan[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + d*Tan[a + b*x]])/3 + ((-4*I)*b^3*x^3*Log[1 + ((c - I*(1 + d
))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d))] + (4*I)*b^3*x^3*Log[1 + ((I + c -
 I*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d))] - 6*b^2*x^2*PolyLog[2, -(((c -
I*(1 + d))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d)))] + 6*b^2*x^2*PolyLog[2, -
(((I + c - I*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d)))] - (6*I)*b*x*PolyLog[
3, -(((c - I*(1 + d))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d)))] + (6*I)*b*x*P
olyLog[3, -(((I + c - I*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d)))] + 3*PolyL
og[4, -(((c - I*(1 + d))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d)))] - 3*PolyLo
```

```
g[4, -(((I + c - I*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d))])/(24*b^3)
```

Maple [C] time = 8.365, size = 8034, normalized size = 19.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+d*tan(b*x+a)),x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*tan(b*x+a)),x, algorithm="maxima")

[Out] 1/6*x^3*arctan2(-(d + 1)*cos(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d - 1, -c*
cos(2*b*x + 2*a) - (d + 1)*sin(2*b*x + 2*a) - c) - 1/6*x^3*arctan2(-(d - 1)
*cos(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d + 1, -c*cos(2*b*x + 2*a) - (d -
1)*sin(2*b*x + 2*a) - c) - 4*b*d*integrate(-1/3*(2*(c^2 + d^2 + 1)*x^3*cos(
2*b*x + 2*a)^2 + 2*c*d*x^3*sin(2*b*x + 2*a) + 2*(c^2 + d^2 + 1)*x^3*sin(2*b
*x + 2*a)^2 + (c^2 - d^2 + 1)*x^3*cos(2*b*x + 2*a) - (2*c*d*x^3*sin(2*b*x +
 2*a) - (c^2 - d^2 + 1)*x^3*cos(2*b*x + 2*a))*cos(4*b*x + 4*a) + (2*c*d*x^3
*cos(2*b*x + 2*a) + (c^2 - d^2 + 1)*x^3*sin(2*b*x + 2*a))*sin(4*b*x + 4*a))
/(c^4 + d^4 + 2*(c^2 - 1)*d^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*c
os(4*b*x + 4*a)^2 + 4*(c^4 + d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*cos(2*b*x +
 2*a)^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*sin(4*b*x + 4*a)^2 + 4*
(c^4 + d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*sin(2*b*x + 2*a)^2 + 2*c^2 + 2*(c
^4 + d^4 - 2*(3*c^2 + 1)*d^2 + 2*c^2 + 2*(c^4 - d^4 + 2*c^2 + 1)*cos(2*b*x
+ 2*a) - 4*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1)*cos(4*b*x + 4*a) + 4
*(c^4 - d^4 + 2*c^2 + 1)*cos(2*b*x + 2*a) - 4*(2*c*d^3 - 2*(c^3 + c)*d - 2*
(c*d^3 + (c^3 + c)*d)*cos(2*b*x + 2*a) - (c^4 - d^4 + 2*c^2 + 1)*sin(2*b*x
+ 2*a))*sin(4*b*x + 4*a) + 8*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1), x
)
```

Fricas [C] time = 3.62622, size = 5146, normalized size = 12.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/48*(16*b^3*x^3*arccot(d*tan(b*x + a) + c) - 6*b^2*x^2*dilog((2*(I*c*d - d
^2 + d)*tan(b*x + a)^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*
I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^
2 - 2*d + 1) + 1) + 6*b^2*x^2*dilog((2*(I*c*d - d^2 - d)*tan(b*x + a)^2 - 2
*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 2*d - 2)
/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1) + 1) - 6*b^2*
x^2*dilog((2*(-I*c*d - d^2 + d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2
 + 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d + 1)*ta
n(b*x + a)^2 + c^2 + d^2 - 2*d + 1) + 1) + 6*b^2*x^2*dilog((2*(-I*c*d - d^2
 - d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d - 2*I*d^2 + 2*I)*
tan(b*x + a) - 2*d - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 +
 2*d + 1) + 1) - 4*I*a^3*log(((I*c*d + d^2 + d)*tan(b*x + a)^2 - c^2 + I*c*
d + (I*c^2 + I*d^2 + 2*I*d + I)*tan(b*x + a) - d - 1)/(tan(b*x + a)^2 + 1))
 + 4*I*a^3*log(((I*c*d + d^2 - d)*tan(b*x + a)^2 - c^2 + I*c*d + (I*c^2 + I
*d^2 - 2*I*d + I)*tan(b*x + a) + d - 1)/(tan(b*x + a)^2 + 1)) - 4*I*a^3*log
(((I*c*d - d^2 + d)*tan(b*x + a)^2 + c^2 + I*c*d + (I*c^2 + I*d^2 - 2*I*d +
 I)*tan(b*x + a) - d + 1)/(tan(b*x + a)^2 + 1)) + 4*I*a^3*log(((I*c*d - d^2
 - d)*tan(b*x + a)^2 + c^2 + I*c*d + (I*c^2 + I*d^2 + 2*I*d + I)*tan(b*x +
a) + d + 1)/(tan(b*x + a)^2 + 1)) - 6*I*b*x*polylog(3, ((c^2 + 2*I*c*d - d^
2 + 1)*tan(b*x + a)^2 - c^2 - 2*I*c*d + d^2 + (2*I*c^2 - 4*c*d - 2*I*d^2 +
2*I)*tan(b*x + a) - 1)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 +
2*d + 1)) + 6*I*b*x*polylog(3, ((c^2 - 2*I*c*d - d^2 + 1)*tan(b*x + a)^2 -
c^2 + 2*I*c*d + d^2 + (-2*I*c^2 - 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 1)/
((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + 6*I*b*x*pol
ylog(3, ((c^2 + 2*I*c*d - d^2 + 1)*tan(b*x + a)^2 - c^2 - 2*I*c*d + d^2 + (
2*I*c^2 - 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) - 1)/((c^2 + d^2 - 2*d + 1)*t
an(b*x + a)^2 + c^2 + d^2 - 2*d + 1)) - 6*I*b*x*polylog(3, ((c^2 - 2*I*c*d
- d^2 + 1)*tan(b*x + a)^2 - c^2 + 2*I*c*d + d^2 + (-2*I*c^2 - 4*c*d + 2*I*d
^2 - 2*I)*tan(b*x + a) - 1)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d
^2 - 2*d + 1)) + (4*I*b^3*x^3 + 4*I*a^3)*log(-(2*(I*c*d - d^2 + d)*tan(b*x
+ a)^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a)
+ 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1)) +
(-4*I*b^3*x^3 - 4*I*a^3)*log(-(2*(I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 -
 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 2*d - 2)/((c^2
 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + (-4*I*b^3*x^3 -
```

```
4*I*a^3)*log(-(2*(-I*c*d - d^2 + d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I
*c^2 + 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d + 1
)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1)) + (4*I*b^3*x^3 + 4*I*a^3)*log(-(2*
(-I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d - 2*
I*d^2 + 2*I)*tan(b*x + a) - 2*d - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2
+ c^2 + d^2 + 2*d + 1)) - 3*polylog(4, ((c^2 + 2*I*c*d - d^2 + 1)*tan(b*x +
 a)^2 - c^2 - 2*I*c*d + d^2 + (2*I*c^2 - 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a
) - 1)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) - 3*po
lylog(4, ((c^2 - 2*I*c*d - d^2 + 1)*tan(b*x + a)^2 - c^2 + 2*I*c*d + d^2 +
(-2*I*c^2 - 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 1)/((c^2 + d^2 + 2*d + 1)
*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + 3*polylog(4, ((c^2 + 2*I*c*d - d^
2 + 1)*tan(b*x + a)^2 - c^2 - 2*I*c*d + d^2 + (2*I*c^2 - 4*c*d - 2*I*d^2 +
2*I)*tan(b*x + a) - 1)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 -
2*d + 1)) + 3*polylog(4, ((c^2 - 2*I*c*d - d^2 + 1)*tan(b*x + a)^2 - c^2 +
2*I*c*d + d^2 + (-2*I*c^2 - 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 1)/((c^2
+ d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+d*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(d \tan(bx + a) + c) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(d*tan(b*x + a) + c), x)
```

3.159 $\int x \cot^{-1}(c + d \tan(a + bx)) \, dx$

Optimal. Leaf size=305

$$-\frac{i\text{PolyLog}\left(3,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{8b^2}+\frac{i\text{PolyLog}\left(3,-\frac{(c+i(1-d))e^{2ia+2ibx}}{c+i(d+1)}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{4b}+\frac{x\text{PolyLog}\left(2,-\right.}{4b}$$

```
[Out] (x^2*ArcCot[c + d*Tan[a + b*x]])/2 - (I/4)*x^2*Log[1 + ((1 + I*c + d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c - d)] + (I/4)*x^2*Log[1 + ((c + I*(1 - d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 + d))] - (x*PolyLog[2, -(((1 + I*c + d)*E^(
(2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/(4*b) + (x*PolyLog[2, -(((c + I*(1 -
 d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d)))])/(4*b) - ((I/8)*PolyLog[3,
-(((1 + I*c + d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/b^2 + ((I/8)*Pol
yLog[3, -(((c + I*(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d)))])/b^2
```

Rubi [A] time = 0.405548, antiderivative size = 305, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {5176, 2190, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{8b^2}+\frac{i\text{PolyLog}\left(3,-\frac{(c+i(1-d))e^{2ia+2ibx}}{c+i(d+1)}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{4b}+\frac{x\text{PolyLog}\left(2,-\right.}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + d*Tan[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Tan[a + b*x]])/2 - (I/4)*x^2*Log[1 + ((1 + I*c + d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c - d)] + (I/4)*x^2*Log[1 + ((c + I*(1 - d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 + d))] - (x*PolyLog[2, -(((1 + I*c + d)*E^(
(2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/(4*b) + (x*PolyLog[2, -(((c + I*(1 -
 d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d)))])/(4*b) - ((I/8)*PolyLog[3,
-(((1 + I*c + d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c - d))])/b^2 + ((I/8)*Pol
yLog[3, -(((c + I*(1 - d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 + d)))])/b^2
```

Rule 5176

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tan[a + b*x]])/(f*(m +
 1)), x] + (-Dist[(b*(1 - I*c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(
2*I*a + 2*I*b*x))/(1 - I*c + d + (1 - I*c - d)*E^(2*I*a + 2*I*b*x)), x], x]
```

```
 + Dist[(b*(1 + I*c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*I*a + 2*
I*b*x))/(1 + I*c - d + (1 + I*c + d)*E^(2*I*a + 2*I*b*x)), x], x]) /; FreeQ
[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && NeQ[(c + I*d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+d\tan(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{2}(b(1-ic-d))\int \frac{e^{2ia+2ibx}x^2}{1-ic+d+(1-ic-d)e^{2ia+2ibx}}\,dx$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{4}ix^2\log\left(1+\right.$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{4}ix^2\log\left(1+\right.$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{4}ix^2\log\left(1+\right.$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{4}ix^2\log\left(1+\right.$$

Mathematica [A] time = 0.589063, size = 272, normalized size = 0.89

$$\frac{1}{2}x^2\cot^{-1}(d\tan(a+bx)+c) - \frac{i\left(-2ibx\text{PolyLog}\left(2,-\frac{(c-i(d+1))e^{2i(a+bx)}}{c+i(d-1)}\right)+2ibx\text{PolyLog}\left(2,-\frac{(c-id+i)e^{2i(a+bx)}}{c+i(d+1)}\right)+\text{PolyLog}\left(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + d*Tan[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Tan[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 + ((c - I*(1 +
 d))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d))] - 2*b^2*x^2*Log[1 + ((I + c - I
*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d))] - (2*I)*b*x*PolyLog[2, -(((c - I*
(1 + d))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d)))] + (2*I)*b*x*PolyLog[2, -((
(I + c - I*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d)))] + PolyLog[3, -(((c - I
*(1 + d))*E^((2*I)*(a + b*x)))/(c + I*(-1 + d)))] - PolyLog[3, -(((I + c -
I*d)*E^((2*I)*(a + b*x)))/(c + I*(1 + d)))]))/b^2
```

Maple [C] time = 31.149, size = 7678, normalized size = 25.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+d*tan(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/4*x^2*arctan2(-(d + 1)*cos(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d - 1, -c*
cos(2*b*x + 2*a) - (d + 1)*sin(2*b*x + 2*a) - c) - 1/4*x^2*arctan2(-(d - 1)
*cos(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d + 1, -c*cos(2*b*x + 2*a) - (d -
1)*sin(2*b*x + 2*a) - c) - 2*b*d*integrate(-(2*(c^2 + d^2 + 1)*x^2*cos(2*b*
x + 2*a)^2 + 2*c*d*x^2*sin(2*b*x + 2*a) + 2*(c^2 + d^2 + 1)*x^2*sin(2*b*x +
 2*a)^2 + (c^2 - d^2 + 1)*x^2*cos(2*b*x + 2*a) - (2*c*d*x^2*sin(2*b*x + 2*a
) - (c^2 - d^2 + 1)*x^2*cos(2*b*x + 2*a))*cos(4*b*x + 4*a) + (2*c*d*x^2*cos
(2*b*x + 2*a) + (c^2 - d^2 + 1)*x^2*sin(2*b*x + 2*a))*sin(4*b*x + 4*a))/(c^
4 + d^4 + 2*(c^2 - 1)*d^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*cos(4
*b*x + 4*a)^2 + 4*(c^4 + d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*cos(2*b*x + 2*a
)^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*sin(4*b*x + 4*a)^2 + 4*(c^4
 + d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*sin(2*b*x + 2*a)^2 + 2*c^2 + 2*(c^4 +
 d^4 - 2*(3*c^2 + 1)*d^2 + 2*c^2 + 2*(c^4 - d^4 + 2*c^2 + 1)*cos(2*b*x + 2*
a) - 4*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1)*cos(4*b*x + 4*a) + 4*(c^
4 - d^4 + 2*c^2 + 1)*cos(2*b*x + 2*a) - 4*(2*c*d^3 - 2*(c^3 + c)*d - 2*(c*d
^3 + (c^3 + c)*d)*cos(2*b*x + 2*a) - (c^4 - d^4 + 2*c^2 + 1)*sin(2*b*x + 2*
a))*sin(4*b*x + 4*a) + 8*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1), x)
```

Fricas [C] time = 3.49119, size = 4035, normalized size = 13.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/16*(8*b^2*x^2*arccot(d*tan(b*x + a) + c) - 2*b*x*dilog((2*(I*c*d - d^2 +
d)*tan(b*x + a)^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*ta
n(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2
*d + 1) + 1) + 2*b*x*dilog((2*(I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 - 2*
```

```
I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 2*d - 2)/((c^2 +
d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1) + 1) - 2*b*x*dilog((2*
(-I*c*d - d^2 + d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d - 2*
I*d^2 + 2*I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2
+ c^2 + d^2 - 2*d + 1) + 1) + 2*b*x*dilog((2*(-I*c*d - d^2 - d)*tan(b*x + a
)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) - 2*
d - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1) + 1) +
2*I*a^2*log(((I*c*d + d^2 + d)*tan(b*x + a)^2 - c^2 + I*c*d + (I*c^2 + I*d^
2 + 2*I*d + I)*tan(b*x + a) - d - 1)/(tan(b*x + a)^2 + 1)) - 2*I*a^2*log(((
I*c*d + d^2 - d)*tan(b*x + a)^2 - c^2 + I*c*d + (I*c^2 + I*d^2 - 2*I*d + I)
*tan(b*x + a) + d - 1)/(tan(b*x + a)^2 + 1)) + 2*I*a^2*log(((I*c*d - d^2 +
d)*tan(b*x + a)^2 + c^2 + I*c*d + (I*c^2 + I*d^2 - 2*I*d + I)*tan(b*x + a)
- d + 1)/(tan(b*x + a)^2 + 1)) - 2*I*a^2*log(((I*c*d - d^2 - d)*tan(b*x + a
)^2 + c^2 + I*c*d + (I*c^2 + I*d^2 + 2*I*d + I)*tan(b*x + a) + d + 1)/(tan(
b*x + a)^2 + 1)) + (2*I*b^2*x^2 - 2*I*a^2)*log(-(2*(I*c*d - d^2 + d)*tan(b*
x + a)^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a
) + 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1))
+ (-2*I*b^2*x^2 + 2*I*a^2)*log(-(2*(I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2
 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 2*d - 2)/((c
^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + (-2*I*b^2*x^2
+ 2*I*a^2)*log(-(2*(-I*c*d - d^2 + d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2
*I*c^2 + 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d +
 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1)) + (2*I*b^2*x^2 - 2*I*a^2)*log(-(
2*(-I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d -
2*I*d^2 + 2*I)*tan(b*x + a) - 2*d - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^
2 + c^2 + d^2 + 2*d + 1)) - I*polylog(3, ((c^2 + 2*I*c*d - d^2 + 1)*tan(b*x
 + a)^2 - c^2 - 2*I*c*d + d^2 + (2*I*c^2 - 4*c*d - 2*I*d^2 + 2*I)*tan(b*x +
 a) - 1)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + I*
polylog(3, ((c^2 - 2*I*c*d - d^2 + 1)*tan(b*x + a)^2 - c^2 + 2*I*c*d + d^2
+ (-2*I*c^2 - 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 1)/((c^2 + d^2 + 2*d +
1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + I*polylog(3, ((c^2 + 2*I*c*d -
d^2 + 1)*tan(b*x + a)^2 - c^2 - 2*I*c*d + d^2 + (2*I*c^2 - 4*c*d - 2*I*d^2
+ 2*I)*tan(b*x + a) - 1)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2
- 2*d + 1)) - I*polylog(3, ((c^2 - 2*I*c*d - d^2 + 1)*tan(b*x + a)^2 - c^2
+ 2*I*c*d + d^2 + (-2*I*c^2 - 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 1)/((c^
2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1)))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+d*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left(d \tan\left(bx+a\right)+c\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(d*tan(b*x + a) + c), x)
```

3.160 $\int \cot^{-1}(c + d\tan(a + bx))\,dx$

Optimal. Leaf size=198

$$-\frac{\text{PolyLog}\left(2,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{4b}+\frac{\text{PolyLog}\left(2,-\frac{(c+i(1-d))e^{2ia+2ibx}}{c+i(d+1)}\right)}{4b}-\frac{1}{2}ix\log\left(1+\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)+\frac{1}{2}ix\log\left(1+\frac{(c$$

```
[Out] x*ArcCot[c + d*Tan[a + b*x]] - (I/2)*x*Log[1 + ((1 + I*c + d)*E^((2*I)*a +
(2*I)*b*x))/(1 + I*c - d)] + (I/2)*x*Log[1 + ((c + I*(1 - d))*E^((2*I)*a +
(2*I)*b*x))/(c + I*(1 + d))] - PolyLog[2, -(((1 + I*c + d)*E^((2*I)*a + (2*
I)*b*x))/(1 + I*c - d))]/(4*b) + PolyLog[2, -(((c + I*(1 - d))*E^((2*I)*a +
 (2*I)*b*x))/(c + I*(1 + d)))]/(4*b)
```

Rubi [A] time = 0.243227, antiderivative size = 198, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {5168, 2190, 2279, 2391}

$$-\frac{\text{PolyLog}\left(2,-\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)}{4b}+\frac{\text{PolyLog}\left(2,-\frac{(c+i(1-d))e^{2ia+2ibx}}{c+i(d+1)}\right)}{4b}-\frac{1}{2}ix\log\left(1+\frac{(ic+d+1)e^{2ia+2ibx}}{ic-d+1}\right)+\frac{1}{2}ix\log\left(1+\frac{(c$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + d*Tan[a + b*x]],x]
```

```
[Out] x*ArcCot[c + d*Tan[a + b*x]] - (I/2)*x*Log[1 + ((1 + I*c + d)*E^((2*I)*a +
(2*I)*b*x))/(1 + I*c - d)] + (I/2)*x*Log[1 + ((c + I*(1 - d))*E^((2*I)*a +
(2*I)*b*x))/(c + I*(1 + d))] - PolyLog[2, -(((1 + I*c + d)*E^((2*I)*a + (2*
I)*b*x))/(1 + I*c - d))]/(4*b) + PolyLog[2, -(((c + I*(1 - d))*E^((2*I)*a +
 (2*I)*b*x))/(c + I*(1 + d)))]/(4*b)
```

Rule 5168

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*ArcC
ot[c + d*Tan[a + b*x]], x] + (-Dist[b*(1 - I*c - d), Int[(x*E^(2*I*a + 2*I*
b*x))/(1 - I*c + d + (1 - I*c - d)*E^(2*I*a + 2*I*b*x)), x], x] + Dist[b*(1
 + I*c + d), Int[(x*E^(2*I*a + 2*I*b*x))/(1 + I*c - d + (1 + I*c + d)*E^(2*
I*a + 2*I*b*x)), x], x]) /; FreeQ[{a, b, c, d}, x] && NeQ[(c + I*d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+d\tan(a+bx))\,dx = x\cot^{-1}(c+d\tan(a+bx)) - (b(1-ic-d))\int \frac{e^{2ia+2ibx}x}{1-ic+d+(1-ic-d)e^{2ia+2ibx}}\,dx + (b(1$$

$$= x\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{2}ix\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{2}ix\log\left(1+\frac{(c+i(1-}{c+i}\right.$$

$$= x\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{2}ix\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{2}ix\log\left(1+\frac{(c+i(1-}{c+i}\right.$$

$$= x\cot^{-1}(c+d\tan(a+bx)) - \frac{1}{2}ix\log\left(1+\frac{(1+ic+d)e^{2ia+2ibx}}{1+ic-d}\right) + \frac{1}{2}ix\log\left(1+\frac{(c+i(1-}{c+i}\right.$$

Mathematica [B] time = 1.66415, size = 555, normalized size = 2.8

$$x\cot^{-1}(d\tan(a+bx)+c) - \frac{x\left(-i\sqrt{-d^2}\left(\text{PolyLog}\left(2,\frac{d^2(1-i\tan(a+bx))}{icd+d^2-i\sqrt{-d^2}}\right)+\log(1-i\tan(a+bx))\log\left(\frac{d^2(-\tan(a+bx))-cd+\sqrt{-d^2}}{-cd+id^2+\sqrt{-d^2}}\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c + d*Tan[a + b*x]],x]
```

```
[Out] x*ArcCot[c + d*Tan[a + b*x]] - (x*(-4*a*d*ArcTan[c + d*Tan[a + b*x]] - I*Sq
rt[-d^2]*(Log[1 - I*Tan[a + b*x]]*Log[(-(c*d) + Sqrt[-d^2] - d^2*Tan[a + b*
x])/(-(c*d) + I*d^2 + Sqrt[-d^2])] + PolyLog[2, (d^2*(1 - I*Tan[a + b*x]))/
(I*c*d + d^2 - I*Sqrt[-d^2])]) + I*Sqrt[-d^2]*(Log[1 - I*Tan[a + b*x]]*Log[
(c*d + Sqrt[-d^2] + d^2*Tan[a + b*x])/(c*d - I*d^2 + Sqrt[-d^2])] + PolyLog
[2, (d^2*(1 - I*Tan[a + b*x]))/(I*c*d + d^2 + I*Sqrt[-d^2])]) + I*Sqrt[-d^2
]*(Log[1 + I*Tan[a + b*x]]*Log[(c*d - Sqrt[-d^2] + d^2*Tan[a + b*x])/(c*d +
 I*d^2 - Sqrt[-d^2])] + PolyLog[2, (d^2*(1 + I*Tan[a + b*x]))/((-I)*c*d + d
^2 + I*Sqrt[-d^2])]) - I*Sqrt[-d^2]*(Log[1 + I*Tan[a + b*x]]*Log[(c*d + Sqr
t[-d^2] + d^2*Tan[a + b*x])/(c*d + I*d^2 + Sqrt[-d^2])] + PolyLog[2, (d^2*(
1 + I*Tan[a + b*x]))/(d^2 - I*(c*d + Sqrt[-d^2]))])))/(2*d*(2*a - I*Log[1 -
 I*Tan[a + b*x]] + I*Log[1 + I*Tan[a + b*x]]))
```

Maple [B] time = 0.314, size = 1142, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*tan(b*x+a)),x)
```

```
[Out] 1/b*arctan(tan(b*x+a))*arccot(c+d*tan(b*x+a))+1/b*arctan(d*((c+d*tan(b*x+a)
)/d-c/d)+c)*arctan((c+d*tan(b*x+a))/d-c/d)-1/2*I*d/b*ln(1-(I-I*d+c)*(1+I*(d
*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))/d-c/d)+c)^2+1)/(I*d+I
-c))*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)/(1+I*c+d)-1/2*I/b*ln(1-(I-I*d+c)*
(1+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))/d-c/d)+c)^2+1)
/(I*d+I-c))*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)/(1+I*c+d)-1/2*I/b/(-I-I*d+
c)*ln(1-(I-I*d+c)*(1+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+
a))/d-c/d)+c)^2+1)/(I*d+I-c))*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)*c-1/2*d/
b*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)^2/(1+I*c+d)-1/4*d/b*polylog(2,(I-I*d
+c)*(1+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))/d-c/d)+c)^
2+1)/(I*d+I-c))/(1+I*c+d)-1/2/b*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)^2/(1+I
*c+d)-1/2/b/(-I-I*d+c)*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)^2*c-1/4/b*polyl
og(2,(I-I*d+c)*(1+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))
/d-c/d)+c)^2+1)/(I*d+I-c))/(1+I*c+d)-1/4/b/(-I-I*d+c)*polylog(2,(I-I*d+c)*(
1+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))/d-c/d)+c)^2+1)/
(I*d+I-c))*c+1/2*I/b*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)*ln(1-(I+I*d+c)*(1
+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))/d-c/d)+c)^2+1)/(
-I*d+I-c))+1/2/b*arctan(d*((c+d*tan(b*x+a))/d-c/d)+c)^2+1/4/b*polylog(2,(I+
I*d+c)*(1+I*(d*((c+d*tan(b*x+a))/d-c/d)+c))^2/((d*((c+d*tan(b*x+a))/d-c/d)+
c)^2+1)/(-I*d+I-c))
```

Maxima [B] time = 1.87091, size = 585, normalized size = 2.95

$$-\frac{d\left(\frac{8\,(bx+a)\arctan\left(\frac{d^2\tan(bx+a)+cd}{d}\right)}{d}-\frac{4\,(bx+a)\arctan\left(\frac{cd+\left(d^2+d\right)\tan(bx+a)}{c^2+d^2+2\,d+1},\frac{cd\tan(bx+a)+c^2+d+1}{c^2+d^2+2\,d+1}\right)-4\,(bx+a)\arctan\left(\frac{cd+\left(d^2-d\right)\tan(bx+a)}{c^2+d^2-2\,d+1},\frac{cd\tan(bx+a)+c^2-d+1}{c^2+d^2-2\,d+1}\right)}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] -1/8*(d*(8*(b*x + a)*arctan((d^2*tan(b*x + a) + c*d)/d)/d - (4*(b*x + a)*ar
ctan2((c*d + (d^2 + d)*tan(b*x + a))/(c^2 + d^2 + 2*d + 1), (c*d*tan(b*x +
a) + c^2 + d + 1)/(c^2 + d^2 + 2*d + 1)) - 4*(b*x + a)*arctan2((c*d + (d^2
- d)*tan(b*x + a))/(c^2 + d^2 - 2*d + 1), (c*d*tan(b*x + a) + c^2 - d + 1)/
(c^2 + d^2 - 2*d + 1)) + log(tan(b*x + a)^2 + 1)*log((d^2*tan(b*x + a)^2 +
2*c*d*tan(b*x + a) + c^2 + 1)/(c^2 + d^2 + 2*d + 1)) - log(tan(b*x + a)^2 +
 1)*log((d^2*tan(b*x + a)^2 + 2*c*d*tan(b*x + a) + c^2 + 1)/(c^2 + d^2 - 2*
d + 1)) + 2*dilog(-(I*d*tan(b*x + a) - d)/(I*c + d + 1)) - 2*dilog(-(I*d*ta
n(b*x + a) - d)/(I*c + d - 1)) + 2*dilog((I*d*tan(b*x + a) + d)/(-I*c + d +
 1)) - 2*dilog((I*d*tan(b*x + a) + d)/(-I*c + d - 1)))/d) - 8*(b*x + a)*arc
cot(d*tan(b*x + a) + c) - 8*(b*x + a)*arctan((d^2*tan(b*x + a) + c*d)/d))/b
```

Fricas [B] time = 3.42933, size = 2894, normalized size = 14.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/8*(8*b*x*arccot(d*tan(b*x + a) + c) + (2*I*b*x + 2*I*a)*log(-(2*(I*c*d -
d^2 + d)*tan(b*x + a)^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2
*I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d
^2 - 2*d + 1)) + (-2*I*b*x - 2*I*a)*log(-(2*(I*c*d - d^2 - d)*tan(b*x + a)^
2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 2*d
 - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 + 2*d + 1)) + (-2*I
*b*x - 2*I*a)*log(-(2*(-I*c*d - d^2 + d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d -
 (2*I*c^2 + 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) + 2*d - 2)/((c^2 + d^2 - 2*
d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1)) + (2*I*b*x + 2*I*a)*log(-(2*(
```

```
-I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d - 2*I
*d^2 + 2*I)*tan(b*x + a) - 2*d - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*x + a)^2 +
 c^2 + d^2 + 2*d + 1)) - 2*I*a*log(((I*c*d + d^2 + d)*tan(b*x + a)^2 - c^2
+ I*c*d + (I*c^2 + I*d^2 + 2*I*d + I)*tan(b*x + a) - d - 1)/(tan(b*x + a)^2
 + 1)) + 2*I*a*log(((I*c*d + d^2 - d)*tan(b*x + a)^2 - c^2 + I*c*d + (I*c^2
 + I*d^2 - 2*I*d + I)*tan(b*x + a) + d - 1)/(tan(b*x + a)^2 + 1)) - 2*I*a*l
og(((I*c*d - d^2 + d)*tan(b*x + a)^2 + c^2 + I*c*d + (I*c^2 + I*d^2 - 2*I*d
 + I)*tan(b*x + a) - d + 1)/(tan(b*x + a)^2 + 1)) + 2*I*a*log(((I*c*d - d^2
 - d)*tan(b*x + a)^2 + c^2 + I*c*d + (I*c^2 + I*d^2 + 2*I*d + I)*tan(b*x +
a) + d + 1)/(tan(b*x + a)^2 + 1)) - dilog((2*(I*c*d - d^2 + d)*tan(b*x + a)
^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) + 2*
d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1) + 1) +
dilog((2*(I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 - 2*I*c*d - (-2*I*c^2 + 4
*c*d + 2*I*d^2 - 2*I)*tan(b*x + a) - 2*d - 2)/((c^2 + d^2 + 2*d + 1)*tan(b*
x + a)^2 + c^2 + d^2 + 2*d + 1) + 1) - dilog((2*(-I*c*d - d^2 + d)*tan(b*x
+ a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2 + 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) +
 2*d - 2)/((c^2 + d^2 - 2*d + 1)*tan(b*x + a)^2 + c^2 + d^2 - 2*d + 1) + 1)
 + dilog((2*(-I*c*d - d^2 - d)*tan(b*x + a)^2 - 2*c^2 + 2*I*c*d - (2*I*c^2
+ 4*c*d - 2*I*d^2 + 2*I)*tan(b*x + a) - 2*d - 2)/((c^2 + d^2 + 2*d + 1)*tan
(b*x + a)^2 + c^2 + d^2 + 2*d + 1) + 1))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(d\tan\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(d*tan(b*x + a) + c), x)
```

3.161 $\int \frac{\cot^{-1}(c+d\tan(a+bx))}{x}\,dx$

Optimal. Leaf size=17

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(d\tan(a+bx)+c)}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + d*Tan[a + b*x]]/x, x]
```

Rubi [A] time = 0.0748455, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{\cot^{-1}(c+d\tan(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + d*Tan[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + d*Tan[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+d\tan(a+bx))}{x}\,dx = \int \frac{\cot^{-1}(c+d\tan(a+bx))}{x}\,dx$$

Mathematica [A] time = 0.320061, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+d\tan(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + d*Tan[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + d*Tan[a + b*x]]/x, x]
```

Maple [A] time = 0.385, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(c + d\tan(bx + a))}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*tan(b*x+a))/x,x)
```

```
[Out] int(arccot(c+d*tan(b*x+a))/x,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tan(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(d\tan(bx + a) + c)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tan(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(d*tan(b*x + a) + c)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*tan(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(d\tan(bx+a)+c)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tan(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(d*tan(b*x + a) + c)/x, x)
```

3.162 $\int x^2 \cot^{-1}(c+(1+ic)\tan(a+bx))\,dx$

Optimal. Leaf size=154

$$\frac{ix\text{PolyLog}\left(3,ice^{2ia+2ibx}\right)}{4b^2}-\frac{\text{PolyLog}\left(4,ice^{2ia+2ibx}\right)}{8b^3}+\frac{x^2\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{3}x^3\cot^{-1}$$

```
[Out] (b*x^4)/12 + (x^3*ArcCot[c + (1 + I*c)*Tan[a + b*x]])/3 + (I/6)*x^3*Log[1 -
 I*c*E^((2*I)*a + (2*I)*b*x)] + (x^2*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)
])/(4*b) + ((I/4)*x*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2 - PolyLog[
4, I*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rubi [A] time = 0.252764, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5172, 2184, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3,ice^{2ia+2ibx}\right)}{4b^2}-\frac{\text{PolyLog}\left(4,ice^{2ia+2ibx}\right)}{8b^3}+\frac{x^2\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{3}x^3\cot^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + (1 + I*c)*Tan[a + b*x]],x]
```

```
[Out] (b*x^4)/12 + (x^3*ArcCot[c + (1 + I*c)*Tan[a + b*x]])/3 + (I/6)*x^3*Log[1 -
 I*c*E^((2*I)*a + (2*I)*b*x)] + (x^2*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)
])/(4*b) + ((I/4)*x*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2 - PolyLog[
4, I*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rule 5172

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tan[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c + I*d + c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c + I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c + (1+ic)\tan(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{3}(ib)\int \frac{x^3}{i(1+ic)+c+ce^{2ia+2ibx}}\,dx$$
$$= \frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) - \frac{1}{3}(bc)\int \frac{e^{2ia+2ibx}x^3}{i(1+ic)+c+ce^{2ia+2ibx}}\,d$$
$$= \frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) - \frac{1}{2}i\int x^2$$
$$= \frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) + \frac{x^2\mathrm{Li}_2(}{}$$
$$= \frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) + \frac{x^2\mathrm{Li}_2(}{}$$
$$= \frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) + \frac{x^2\mathrm{Li}_2(}{}$$
$$= \frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) + \frac{x^2\mathrm{Li}_2(}{}$$

Mathematica [A] time = 0.202893, size = 136, normalized size = 0.88

$$\frac{1}{24}\left(\frac{6ix\mathrm{PolyLog}\left(3,-\frac{ie^{-2i(a+bx)}}{c}\right)}{b^2} + \frac{3\mathrm{PolyLog}\left(4,-\frac{ie^{-2i(a+bx)}}{c}\right)}{b^3} - \frac{6x^2\mathrm{PolyLog}\left(2,-\frac{ie^{-2i(a+bx)}}{c}\right)}{b} + 4ix^3\log\left(1+\frac{ie^{-2i(a+bx)}}{c}\right) + 8\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + (1 + I*c)*Tan[a + b*x]],x]
```

```
[Out] (8*x^3*ArcCot[c + (1 + I*c)*Tan[a + b*x]] + (4*I)*x^3*Log[1 + I/(c*E^((2*I)
*(a + b*x)))] - (6*x^2*PolyLog[2, (-I)/(c*E^((2*I)*(a + b*x)))])/b + ((6*I)
*x*PolyLog[3, (-I)/(c*E^((2*I)*(a + b*x)))])/b^2 + (3*PolyLog[4, (-I)/(c*E^
((2*I)*(a + b*x)))])/b^3)/24
```

Maple [C] time = 23.174, size = 1526, normalized size = 9.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+(1+I*c)*tan(b*x+a)),x)
```

```
[Out] 1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))*x-1/2*I/b^2*ln(1-I*c*exp(
2*I*(b*x+a)))*x*a^2+1/2*I/b^2*a^2*ln(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))*x+1/1
2*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))^3-1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))+1)
)*csgn(I*(c*exp(2*I*(b*x+a))+I))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*
x+a))+1))-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))*c
sgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^2+1/12*x^3*Pi*csgn(I/(exp(
2*I*(b*x+a))+1))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2+1/12
*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2
*I*(b*x+a))+1))^2-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b*x+
a))*(c-I)/(exp(2*I*(b*x+a))+1))^2+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)
/(exp(2*I*(b*x+a))+1))*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2-
1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))
^2-1/12*x^3*Pi*csgn(I*(c-I))*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))^2-1/12*x^3*
Pi*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*
I*(b*x+a))+1))^2+1/12*b*x^4+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(
2*I*(b*x+a))+1))*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))+1/2*I/b^
3*a^3*ln(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*
x+a))+I)/(exp(2*I*(b*x+a))+1))^3+1/2/b^3*a^2*dilog(1-I*exp(I*(b*x+a))*(-I*c
)^(1/2))+1/2/b^3*a^2*dilog(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))+1/4*x^2*polylog
(2,I*c*exp(2*I*(b*x+a)))/b-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2
*I*(b*x+a))+1))*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))+1/6*I*x^3
*ln(c-I)+1/12*x^3*Pi*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))^3+1/3*I*x^3*ln(exp(
I*(b*x+a)))+1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c-I))*csgn(I*(
c-I)/(exp(2*I*(b*x+a))+1))+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*(c-I
)/(exp(2*I*(b*x+a))+1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))
+1/2*I/b^3*a^3*ln(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))-1/3*I/b^3*ln(1-I*c*exp(2
*I*(b*x+a)))*a^3-1/6*I/b^3*a^3*ln(c*exp(2*I*(b*x+a))+I)+1/4*I*x*polylog(3,I
*c*exp(2*I*(b*x+a)))/b^2-1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(
b*x+a))+1))^3+1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))
^2+1/6*I*x^3*ln(1-I*c*exp(2*I*(b*x+a)))+1/12*x^3*Pi*csgn(I*exp(I*(b*x+a)))^
2*csgn(I*exp(2*I*(b*x+a)))-1/6*I*x^3*ln(c*exp(2*I*(b*x+a))+I)-1/4/b^3*polyl
og(2,I*c*exp(2*I*(b*x+a)))*a^2+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(e
xp(2*I*(b*x+a))+1))^3-1/8*polylog(4,I*c*exp(2*I*(b*x+a)))/b^3-1/12*x^3*Pi*c
sgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^3+1/12*x^3*Pi*csgn((c*exp(
2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2-1/6*x^3*Pi*csgn(I*exp(I*(b*x+a)))*c
sgn(I*exp(2*I*(b*x+a)))^2
```

Maxima [B] time = 1.13204, size = 417, normalized size = 2.71

$$\frac{\frac{\left((bx+a)^3-3\,(bx+a)^2a+3\,(bx+a)a^2\right)\operatorname{arccot}((ic+1)\tan(bx+a)+c)}{b^2}-\frac{3\left(-3i\,(bx+a)^4+12i\,(bx+a)^3a-18i\,(bx+a)^2a^2+\left(-8i\,(bx+a)^3+18i\,(bx+a)^2a-18i\,(bx+a)a^2\right)\operatorname{arcta}}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*(((b*x + a)^3 - 3*(b*x + a)^2*a + 3*(b*x + a)*a^2)*arccot((I*c + 1)*tan
(b*x + a) + c)/b^2 - 3*(-3*I*(b*x + a)^4 + 12*I*(b*x + a)^3*a - 18*I*(b*x +
 a)^2*a^2 + (-8*I*(b*x + a)^3 + 18*I*(b*x + a)^2*a - 18*I*(b*x + a)*a^2)*ar
ctan2(c*cos(2*b*x + 2*a), c*sin(2*b*x + 2*a) + 1) + (-12*I*(b*x + a)^2 + 18
*I*(b*x + a)*a - 9*I*a^2)*dilog(I*c*e^(2*I*b*x + 2*I*a)) + (4*(b*x + a)^3 -
 9*(b*x + a)^2*a + 9*(b*x + a)*a^2)*log(c^2*cos(2*b*x + 2*a)^2 + c^2*sin(2*
b*x + 2*a)^2 + 2*c*sin(2*b*x + 2*a) + 1) + 3*(4*b*x + a)*polylog(3, I*c*e^(
2*I*b*x + 2*I*a)) + 6*I*polylog(4, I*c*e^(2*I*b*x + 2*I*a)))*(-I*c - 1)/(b^
2*(12*c - 12*I)))/b
```

Fricas [C] time = 2.68018, size = 902, normalized size = 5.86

$$\frac{b^4x^4-2i\,b^3x^3\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c-i}\right)+6\,b^2x^2\operatorname{Li}_2\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(i\,bx+i\,a)}\right)+6\,b^2x^2\operatorname{Li}_2\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(i\,bx+i\,a)}\right)-a^4-2i\,a^3\log\left(\frac{2c}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(b^4*x^4 - 2*I*b^3*x^3*log((c*e^(2*I*b*x + 2*I*a) + I)*e^(-2*I*b*x - 2
*I*a)/(c - I)) + 6*b^2*x^2*dilog(1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + 6*b^2*x
^2*dilog(-1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) - a^4 - 2*I*a^3*log(1/2*(2*c*e^(
I*b*x + I*a) + I*sqrt(4*I*c))/c) - 2*I*a^3*log(1/2*(2*c*e^(I*b*x + I*a) - I
*sqrt(4*I*c))/c) + 12*I*b*x*polylog(3, 1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + 1
2*I*b*x*polylog(3, -1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + (2*I*b^3*x^3 + 2*I*a
^3)*log(1/2*sqrt(4*I*c)*e^(I*b*x + I*a) + 1) + (2*I*b^3*x^3 + 2*I*a^3)*log(
-1/2*sqrt(4*I*c)*e^(I*b*x + I*a) + 1) - 12*polylog(4, 1/2*sqrt(4*I*c)*e^(I*
b*x + I*a)) - 12*polylog(4, -1/2*sqrt(4*I*c)*e^(I*b*x + I*a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+(1+I*c)*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}\left((i\,c+1)\tan\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot((I*c + 1)*tan(b*x + a) + c), x)
```

3.163 $\int x\cot^{-1}(c+(1+ic)\tan(a+bx))\,dx$

Optimal. Leaf size=123

$$\frac{i\text{PolyLog}\left(3,ice^{2ia+2ibx}\right)}{8b^2}+\frac{x\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx))+$$

```
[Out] (b*x^3)/6 + (x^2*ArcCot[c + (1 + I*c)*Tan[a + b*x]])/2 + (I/4)*x^2*Log[1 -
I*c*E^((2*I)*a + (2*I)*b*x)] + (x*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)])/
(4*b) + ((I/8)*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rubi [A] time = 0.220351, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {5172, 2184, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3,ice^{2ia+2ibx}\right)}{8b^2}+\frac{x\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx))+$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + (1 + I*c)*Tan[a + b*x]],x]
```


```
[Out] (b*x^3)/6 + (x^2*ArcCot[c + (1 + I*c)*Tan[a + b*x]])/2 + (I/4)*x^2*Log[1 -
I*c*E^((2*I)*a + (2*I)*b*x)] + (x*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)])/
(4*b) + ((I/8)*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```


Rule 5172

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tan[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c + I*d + c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c + I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+(1+ic)\tan(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{2}(ib)\int \frac{x^2}{i(1+ic)+c+ce^{2ia+2ibx}}\,dx$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx)) - \frac{1}{2}(bc)\int \frac{e^{2ia+2ibx}x^2}{i(1+ic)+c+ce^{2ia+2ibx}}\,dx$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right) - \frac{1}{2}i\int x\,\mathrm{lo}$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right) + \frac{x\mathrm{Li}_2\left(ice\right.}{4}$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right) + \frac{x\mathrm{Li}_2\left(ice\right.}{4}$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right) + \frac{x\mathrm{Li}_2\left(ice\right.}{4}$$

Mathematica [A] time = 0.112315, size = 110, normalized size = 0.89

$$\frac{i\left(2ibx\mathrm{PolyLog}\left(2,-\frac{ie^{-2i(a+bx)}}{c}\right)+\mathrm{PolyLog}\left(3,-\frac{ie^{-2i(a+bx)}}{c}\right)+2b^2x^2\log\left(1+\frac{ie^{-2i(a+bx)}}{c}\right)\right)}{8b^2}+\frac{1}{2}x^2\cot^{-1}(c+(1+ic)\tan(a+bx$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + (1 + I*c)*Tan[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (1 + I*c)*Tan[a + b*x]])/2 + ((I/8)*(2*b^2*x^2*Log[1 + I/(c
*E^((2*I)*(a + b*x)))] + (2*I)*b*x*PolyLog[2, (-I)/(c*E^((2*I)*(a + b*x)))]
 + PolyLog[3, (-I)/(c*E^((2*I)*(a + b*x)))]))/b^2
```

Maple [C] time = 12.351, size = 1491, normalized size = 12.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+(1+I*c)*tan(b*x+a)),x)
```

```
[Out] 1/2*I/b*ln(1-I*c*exp(2*I*(b*x+a)))*x*a-1/2*I/b*a*ln(1+I*exp(I*(b*x+a))*(-I*
c)^(1/2))*x-1/2/b^2*a*dilog(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))+1/4*I*x^2*ln(1
```

```
-I*c*exp(2*I*(b*x+a)))-1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))+1/
4*I/b^2*ln(1-I*c*exp(2*I*(b*x+a)))*a^2+1/4*I/b^2*a^2*ln(c*exp(2*I*(b*x+a))+
I)-1/2*I/b^2*a^2*ln(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))-1/8*x^2*Pi*csgn(exp(2*
I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^3+1/4*I*x^2*ln(c-I)+1/8*I*polylog(3,
I*c*exp(2*I*(b*x+a)))/b^2+1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c
-I))*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))
*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*
(b*x+a))+1))-1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c*exp(2*I*(b*x
+a))+I))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))+1/8*x^2*Pi*csg
n((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2+1/8*x^2*Pi*csgn(exp(2*I*(b
*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^2+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(c-
I)/(exp(2*I*(b*x+a))+1))*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))+
1/6*b*x^3+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^3+
1/4*x*polylog(2,I*c*exp(2*I*(b*x+a)))/b-1/4*I*x^2*ln(c*exp(2*I*(b*x+a))+I)-
1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))*csgn(exp(2*I
*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a
))+I)/(exp(2*I*(b*x+a))+1))^3+1/8*x^2*Pi*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))
^3+1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))*csgn((c*e
xp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+
a))+1))*csgn(I*(c-I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I*(c-I))*csgn(
I*(c-I)/(exp(2*I*(b*x+a))+1))^2+1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csg
n(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2+1/8*x^2*Pi*csgn(I*(c*exp
(2*I*(b*x+a))+I))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^2-1/8
*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))*csgn((c*exp(2*I
*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))-1/2*I/b*a*ln(1-I*exp(I*(b*x+a))*(-I*c)^(
1/2))*x-1/8*x^2*Pi*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))+1))^3+1/8*
x^2*Pi*csgn(I*exp(2*I*(b*x+a)))^3+1/4/b^2*polylog(2,I*c*exp(2*I*(b*x+a)))*a
-1/2/b^2*a*dilog(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))+1/8*x^2*Pi*csgn(I*exp(I*(
b*x+a)))^2*csgn(I*exp(2*I*(b*x+a)))-1/4*x^2*Pi*csgn(I*exp(I*(b*x+a)))*csgn(
I*exp(2*I*(b*x+a)))^2-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b
*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I*(c-I)/(exp(2*I*(b*x+
a))+1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))+1))^2+1/2*I*x^2*ln(
exp(I*(b*x+a)))
```

Maxima [B] time = 1.06528, size = 294, normalized size = 2.39

$$\frac{\frac{\left((bx+a)^2-2\,(bx+a)a\right)\operatorname{arccot}((ic+1)\tan(bx+a)+c)}{b}-\frac{2\left(-4i\,(bx+a)^3+12i\,(bx+a)^2a-6i\,bx\operatorname{Li}_2\left(i\,ce^{(2i\,bx+2i\,a)}\right)+\left(-6i\,(bx+a)^2+12i\,(bx+a)a\right)\arctan(c\cos(2\,bx+2\,a)}{}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*(((b*x + a)^2 - 2*(b*x + a)*a)*arccot((I*c + 1)*tan(b*x + a) + c)/b - 2
*(-4*I*(b*x + a)^3 + 12*I*(b*x + a)^2*a - 6*I*b*x*dilog(I*c*e^(2*I*b*x + 2*
I*a)) + (-6*I*(b*x + a)^2 + 12*I*(b*x + a)*a)*arctan2(c*cos(2*b*x + 2*a), c
*sin(2*b*x + 2*a) + 1) + 3*((b*x + a)^2 - 2*(b*x + a)*a)*log(c^2*cos(2*b*x
+ 2*a)^2 + c^2*sin(2*b*x + 2*a)^2 + 2*c*sin(2*b*x + 2*a) + 1) + 3*polylog(3
, I*c*e^(2*I*b*x + 2*I*a)))*(-I*c - 1)/(b*(12*c - 12*I)))/b
```

Fricas [C] time = 2.44242, size = 749, normalized size = 6.09

$$\frac{2\,b^3x^3 - 3i\,b^2x^2\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c-i}\right) + 2\,a^3 + 6\,bx\mathrm{Li}_2\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(i\,bx+i\,a)}\right) + 6\,bx\mathrm{Li}_2\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(i\,bx+i\,a)}\right) + 3i\,a^2\log\left(\frac{2c}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(2*b^3*x^3 - 3*I*b^2*x^2*log((c*e^(2*I*b*x + 2*I*a) + I)*e^(-2*I*b*x -
 2*I*a)/(c - I)) + 2*a^3 + 6*b*x*dilog(1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + 6
*b*x*dilog(-1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + 3*I*a^2*log(1/2*(2*c*e^(I*b*
x + I*a) + I*sqrt(4*I*c))/c) + 3*I*a^2*log(1/2*(2*c*e^(I*b*x + I*a) - I*sqr
t(4*I*c))/c) + (3*I*b^2*x^2 - 3*I*a^2)*log(1/2*sqrt(4*I*c)*e^(I*b*x + I*a)
+ 1) + (3*I*b^2*x^2 - 3*I*a^2)*log(-1/2*sqrt(4*I*c)*e^(I*b*x + I*a) + 1) +
6*I*polylog(3, 1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + 6*I*polylog(3, -1/2*sqrt(
4*I*c)*e^(I*b*x + I*a)))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+(1+I*c)*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x\,\mathrm{arccot}\left((i\,c+1)\tan\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot((I*c + 1)*tan(b*x + a) + c), x)
```

3.164 $\int \cot^{-1}(c+(1+ic)\tan(a+bx))\,dx$

Optimal. Leaf size=85

$$\frac{\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}+\frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right)+x\cot^{-1}(c+(1+ic)\tan(a+bx))+\frac{bx^2}{2}$$

```
[Out] (b*x^2)/2 + x*ArcCot[c + (1 + I*c)*Tan[a + b*x]] + (I/2)*x*Log[1 - I*c*E^((
2*I)*a + (2*I)*b*x)] + PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rubi [A] time = 0.131599, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294, Rules used = {5164, 2184, 2190, 2279, 2391}

$$\frac{\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}+\frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right)+x\cot^{-1}(c+(1+ic)\tan(a+bx))+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + (1 + I*c)*Tan[a + b*x]],x]
```

```
[Out] (b*x^2)/2 + x*ArcCot[c + (1 + I*c)*Tan[a + b*x]] + (I/2)*x*Log[1 - I*c*E^((
2*I)*a + (2*I)*b*x)] + PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rule 5164

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*ArcC
ot[c + d*Tan[a + b*x]], x] + Dist[I*b, Int[x/(c + I*d + c*E^(2*I*a + 2*I*b*
x)), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c + I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+(1+ic)\tan(a+bx))\,dx = x\cot^{-1}(c+(1+ic)\tan(a+bx)) + (ib)\int \frac{x}{i(1+ic)+c+ce^{2ia+2ibx}}\,dx$$

$$= \frac{bx^2}{2} + x\cot^{-1}(c+(1+ic)\tan(a+bx)) - (bc)\int \frac{e^{2ia+2ibx}x}{i(1+ic)+c+ce^{2ia+2ibx}}\,dx$$

$$= \frac{bx^2}{2} + x\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right) - \frac{1}{2}i\int \log\left(1\right.$$

$$= \frac{bx^2}{2} + x\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right) - \frac{\text{Subst}\left(\int \frac{\log}{}\right.}{}$$

$$= \frac{bx^2}{2} + x\cot^{-1}(c+(1+ic)\tan(a+bx)) + \frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right) + \frac{\text{Li}_2\left(ice^{2ia+2}\right.}{4b}$$

Mathematica [B] time = 2.70852, size = 967, normalized size = 11.38

$$x\cot^{-1}(c+(ic+1)\tan(a+bx)) - \frac{}{((c+i)\cos(a+bx)+(ic+1)\sin(a+bx))\left(\log(i\tan(bx)+1)\tan(bx)\cos^2(a)+2bx\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c + (1 + I*c)*Tan[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (1 + I*c)*Tan[a + b*x]] - (I*x*((2*I)*b*x*Log[2*Cos[b*x]*(Cos[
b*x] - I*Sin[b*x])] - Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*((I + c)*Cos[a + b*
```

```
x] + (1 + I*c)*Sin[a + b*x]))/(2*c)]*Log[1 - I*Tan[b*x]] + Log[(Sec[b*x]*((
1 - I*c)*Cos[a + b*x] + (-I + c)*Sin[a + b*x]))/(2*Cos[a] - (2*I)*Sin[a])]*
Log[1 + I*Tan[b*x]] - PolyLog[2, -Cos[2*b*x] + I*Sin[2*b*x]] - PolyLog[2, (
Sec[b*x]*((-I + c)*Cos[a] + I*(I + c)*Sin[a])*(Cos[a + b*x] - I*Sin[a + b*x
]))/(2*c)] + PolyLog[2, (Sec[b*x]*((1 + I*c)*Cos[a] - (I + c)*Sin[a])*(Cos[
a + b*x] + I*Sin[a + b*x]))/2])*Sec[a + b*x]^2*(Cos[b*x] + I*Sin[b*x])*(I*C
os[b*x] + Sin[b*x])*((1 - I*c)*Cos[a + b*x] + (-I + c)*Sin[a + b*x]))/(((I
+ c)*Cos[a + b*x] + (1 + I*c)*Sin[a + b*x])*(2*b*x - I*Log[1 - (Sec[b*x]*((
-I + c)*Cos[a] + I*(I + c)*Sin[a])*(Cos[a + b*x] - I*Sin[a + b*x]))/(2*c)]
- I*Log[1 + (Sec[b*x]*((-1 - I*c)*Cos[a] + (I + c)*Sin[a])*(Cos[a + b*x] +
I*Sin[a + b*x]))/2] - (I*(-I + c)*Cos[a + b*x]*(Log[1 - I*Tan[b*x]] - Log[1
 + I*Tan[b*x]]))/((I + c)*Cos[a + b*x] + (1 + I*c)*Sin[a + b*x]) + ((I + c)
*(Log[1 - I*Tan[b*x]] - Log[1 + I*Tan[b*x]])*Sin[a + b*x])/((I + c)*Cos[a +
 b*x] + (1 + I*c)*Sin[a + b*x]) - (2*I)*b*x*Tan[b*x] + Log[1 - (Sec[b*x]*((
-I + c)*Cos[a] + I*(I + c)*Sin[a])*(Cos[a + b*x] - I*Sin[a + b*x]))/(2*c)]*
Tan[b*x] - Log[1 + (Sec[b*x]*((-1 - I*c)*Cos[a] + (I + c)*Sin[a])*(Cos[a +
b*x] + I*Sin[a + b*x]))/2]*Tan[b*x] - Log[1 - I*Tan[b*x]]*Tan[b*x] + Cos[a]
^2*Log[1 + I*Tan[b*x]]*Tan[b*x] + Log[1 + I*Tan[b*x]]*Sin[a]^2*Tan[b*x] + (
Log[(Sec[b*x]*((1 - I*c)*Cos[a + b*x] + (-I + c)*Sin[a + b*x]))/(2*Cos[a] -
 (2*I)*Sin[a])]*Sec[b*x]^2)/(-I + Tan[b*x]) - (Log[(Sec[b*x]*(Cos[a] - I*Si
n[a])*((I + c)*Cos[a + b*x] + (1 + I*c)*Sin[a + b*x]))/(2*c)]*Sec[b*x]^2)/(
I + Tan[b*x]))*(-I + Tan[a + b*x])*(1 - I*c + (-I + c)*Tan[a + b*x]))
```

Maple [B] time = 0.11, size = 1489, normalized size = 17.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+(1+I*c)*tan(b*x+a)),x)
```

```
[Out] 1/4*I/(1+I*c)/b/(I-c)*dilog(-1/2*I*(c+(1+I*c)*tan(b*x+a)+I))-1/8*I/(1+I*c)/
b/(I-c)*ln(c+(1+I*c)*tan(b*x+a)-I)^2+1/4/(1+I*c)/b/(I-c)*ln(c+(1+I*c)*tan(b
*x+a)-I)^2*c+1/2/(1+I*c)/b/(I-c)*dilog(1/2*(c+(1+I*c)*tan(b*x+a)+I)/c)*c-1/
2/(1+I*c)/b/(I-c)*dilog((c+(1+I*c)*tan(b*x+a)-I)/(-2*I+2*c))*c-1/4*I/(1+I*c
)/b/(I-c)*dilog(1/2*(c+(1+I*c)*tan(b*x+a)+I)/c)+1/4*I/(1+I*c)/b/(I-c)*dilog
((c+(1+I*c)*tan(b*x+a)-I)/(-2*I+2*c))+1/(1+I*c)/b*arccot(c+(1+I*c)*tan(b*x+
a))/(2*I-2*c)*ln(c+(1+I*c)*tan(b*x+a)-I)-1/2/(1+I*c)/b/(I-c)*dilog(-1/2*I*(
c+(1+I*c)*tan(b*x+a)+I))*c-1/(1+I*c)/b*arccot(c+(1+I*c)*tan(b*x+a))/(2*I-2*
c)*ln((1+I*c)*tan(b*x+a)-c+I)+1/4*I/(1+I*c)/b/(I-c)*dilog(1/2*(c+(1+I*c)*ta
n(b*x+a)+I)/c)*c^2-1/4*I/(1+I*c)/b/(I-c)*ln(1/2*(c+(1+I*c)*tan(b*x+a)+I)/c)
*ln((1+I*c)*tan(b*x+a)-c+I)+1/4*I/(1+I*c)/b/(I-c)*ln((c+(1+I*c)*tan(b*x+a)-
```

```
I)/(-2*I+2*c))*ln((1+I*c)*tan(b*x+a)-c+I)-1/4*I/(1+I*c)/b/(I-c)*dilog((c+(1
+I*c)*tan(b*x+a)-I)/(-2*I+2*c))*c^2+1/4*I/(1+I*c)/b/(I-c)*ln(-1/2*I*(c+(1+I
*c)*tan(b*x+a)+I))*ln(c+(1+I*c)*tan(b*x+a)-I)+1/2/(1+I*c)/b/(I-c)*ln(1/2*(c
+(1+I*c)*tan(b*x+a)+I)/c)*ln((1+I*c)*tan(b*x+a)-c+I)*c+1/(1+I*c)/b*arccot(c
+(1+I*c)*tan(b*x+a))/(2*I-2*c)*ln((1+I*c)*tan(b*x+a)-c+I)*c^2-1/(1+I*c)/b*a
rccot(c+(1+I*c)*tan(b*x+a))/(2*I-2*c)*ln(c+(1+I*c)*tan(b*x+a)-I)*c^2-1/2/(1
+I*c)/b/(I-c)*ln((c+(1+I*c)*tan(b*x+a)-I)/(-2*I+2*c))*ln((1+I*c)*tan(b*x+a)
-c+I)*c-1/4*I/(1+I*c)/b/(I-c)*dilog(-1/2*I*(c+(1+I*c)*tan(b*x+a)+I))*c^2-1/
2/(1+I*c)/b/(I-c)*ln(-1/2*I*(c+(1+I*c)*tan(b*x+a)+I))*ln(c+(1+I*c)*tan(b*x+
a)-I)*c+1/8*I/(1+I*c)/b/(I-c)*ln(c+(1+I*c)*tan(b*x+a)-I)^2*c^2-1/4*I/(1+I*c
)/b/(I-c)*ln(-1/2*I*(c+(1+I*c)*tan(b*x+a)+I))*ln(c+(1+I*c)*tan(b*x+a)-I)*c^
2+1/4*I/(1+I*c)/b/(I-c)*ln(1/2*(c+(1+I*c)*tan(b*x+a)+I)/c)*ln((1+I*c)*tan(b
*x+a)-c+I)*c^2-1/4*I/(1+I*c)/b/(I-c)*ln((c+(1+I*c)*tan(b*x+a)-I)/(-2*I+2*c)
)*ln((1+I*c)*tan(b*x+a)-c+I)*c^2-2*I/(1+I*c)/b*arccot(c+(1+I*c)*tan(b*x+a))
/(2*I-2*c)*ln((1+I*c)*tan(b*x+a)-c+I)*c+2*I/(1+I*c)/b*arccot(c+(1+I*c)*tan(
b*x+a))/(2*I-2*c)*ln(c+(1+I*c)*tan(b*x+a)-I)*c
```

Maxima [B] time = 1.62273, size = 614, normalized size = 7.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] -1/8*((-I*c - 1)*(4*I*(b*x + a)*log((2*I*c^2 - 2*(c^2 - 2*I*c - 1)*tan(b*x
+ a) + 4*c - 2*I)/(2*I*c^2 - 2*(c^2 - 2*I*c - 1)*tan(b*x + a) + 2*I))/(I*c
+ 1) - I*(4*(b*x + a)*(log(-I*c^2 + (c^2 - 2*I*c - 1)*tan(b*x + a) - 2*c +
I) - log(-I*c^2 + (c^2 - 2*I*c - 1)*tan(b*x + a) - I)) + I*log(-I*c^2 + (c^
2 - 2*I*c - 1)*tan(b*x + a) - 2*c + I)^2 - 2*I*log(-I*c^2 + (c^2 - 2*I*c -
1)*tan(b*x + a) - I)*log(-1/2*(c - I)*tan(b*x + a) + 1/2*I*c + 1/2) + 2*I*l
og(-I*c^2 + (c^2 - 2*I*c - 1)*tan(b*x + a) - I)*log(-1/2*((I*c + 1)*tan(b*x
 + a) + c + I)/c + 1) - 2*I*log(-I*c^2 + (c^2 - 2*I*c - 1)*tan(b*x + a) - 2
*c + I)*log(-1/2*I*tan(b*x + a) + 1/2) - 2*I*dilog(1/2*(c - I)*tan(b*x + a)
 - 1/2*I*c + 1/2) + 2*I*dilog(1/2*((I*c + 1)*tan(b*x + a) + c + I)/c) - 2*I
*dilog(1/2*I*tan(b*x + a) + 1/2))/(I*c + 1)) - 8*(b*x + a)*arccot((I*c + 1)
*tan(b*x + a) + c) - 4*(b*x + a)*(c - I)*log((2*I*c^2 - 2*(c^2 - 2*I*c - 1)
*tan(b*x + a) + 4*c - 2*I)/(2*I*c^2 - 2*(c^2 - 2*I*c - 1)*tan(b*x + a) + 2*
I))/(I*c + 1))/b
```

Fricas [B] time = 2.55377, size = 541, normalized size = 6.36

$$\frac{b^2x^2 - i\,bx\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c-i}\right) - a^2 + (i\,bx + i\,a)\log\left(\frac{1}{2}\sqrt{4i\,c}e^{(i\,bx+i\,a)}+1\right) + (i\,bx + i\,a)\log\left(-\frac{1}{2}\sqrt{4i\,c}e^{(i\,bx+i\,a)}+1\right)}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(b^2*x^2 - I*b*x*log((c*e^(2*I*b*x + 2*I*a) + I)*e^(-2*I*b*x - 2*I*a)/(
c - I)) - a^2 + (I*b*x + I*a)*log(1/2*sqrt(4*I*c)*e^(I*b*x + I*a) + 1) + (I
*b*x + I*a)*log(-1/2*sqrt(4*I*c)*e^(I*b*x + I*a) + 1) - I*a*log(1/2*(2*c*e^
(I*b*x + I*a) + I*sqrt(4*I*c))/c) - I*a*log(1/2*(2*c*e^(I*b*x + I*a) - I*sq
rt(4*I*c))/c) + dilog(1/2*sqrt(4*I*c)*e^(I*b*x + I*a)) + dilog(-1/2*sqrt(4*
I*c)*e^(I*b*x + I*a)))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+(1+I*c)*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left((i\,c+1)\tan\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(1+I*c)*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot((I*c + 1)*tan(b*x + a) + c), x)
```

3.165 $\int \frac{\cot^{-1}(c+(1+ic)\tan(a+bx))}{x} \, dx$

Optimal. Leaf size=23

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c+(1+ic)\tan(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + (1 + I*c)*Tan[a + b*x]]/x, x]
```

Rubi [A] time = 0.10437, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{\cot^{-1}(c+(1+ic)\tan(a+bx))}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + (1 + I*c)*Tan[a + b*x]]/x,x]

[Out] Defer[Int][ArcCot[c + (1 + I*c)*Tan[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+(1+ic)\tan(a+bx))}{x} \, dx = \int \frac{\cot^{-1}(c+(1+ic)\tan(a+bx))}{x} \, dx$$

Mathematica [A] time = 0.320209, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+(1+ic)\tan(a+bx))}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + (1 + I*c)*Tan[a + b*x]]/x,x]

[Out] Integrate[ArcCot[c + (1 + I*c)*Tan[a + b*x]]/x, x]
```

Maple [A] time = 0.415, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c+(1+ic)\tan\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+(1+I*c)*tan(b*x+a))/x,x)
```

```
[Out] int(arccot(c+(1+I*c)*tan(b*x+a))/x,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(1+I*c)*tan(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(-\frac{i\,\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c-i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(1+I*c)*tan(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(-1/2*I*log((c*e^(2*I*b*x + 2*I*a) + I)*e^(-2*I*b*x - 2*I*a)/(c - I
))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+(1+I*c)*tan(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left((i\,c+1)\tan\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(1+I*c)*tan(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot((I*c + 1)*tan(b*x + a) + c)/x, x)
```

3.166 $\int x^2 \cot^{-1}(c - (1 - ic)\tan(a + bx))\,dx$

Optimal. Leaf size=155

$$-\frac{ix\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{4b^2}+\frac{\text{PolyLog}\left(4,-ice^{2ia+2ibx}\right)}{8b^3}-\frac{x^2\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}-\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{3}x^3$$

```
[Out] -(b*x^4)/12 + (x^3*ArcCot[c - (1 - I*c)*Tan[a + b*x]])/3 - (I/6)*x^3*Log[1
+ I*c*E^((2*I)*a + (2*I)*b*x)] - (x^2*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*
b*x)])/(4*b) - ((I/4)*x*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2 + P
olyLog[4, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rubi [A] time = 0.26094, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {5172, 2184, 2190, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{4b^2}+\frac{\text{PolyLog}\left(4,-ice^{2ia+2ibx}\right)}{8b^3}-\frac{x^2\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}-\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{3}x^3$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c - (1 - I*c)*Tan[a + b*x]],x]
```

```
[Out] -(b*x^4)/12 + (x^3*ArcCot[c - (1 - I*c)*Tan[a + b*x]])/3 - (I/6)*x^3*Log[1
+ I*c*E^((2*I)*a + (2*I)*b*x)] - (x^2*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*
b*x)])/(4*b) - ((I/4)*x*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2 + P
olyLog[4, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rule 5172

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tan[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c + I*d + c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c + I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c-(1-ic)\tan(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) + \frac{1}{3}(ib)\int \frac{x^3}{i(-1+ic)+c+ce^{2ia+2ibx}}\,dx$$

$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) + \frac{1}{3}(bc)\int \frac{e^{2ia+2ibx}x^3}{i(-1+ic)+c+ce^{2ia+2ibx}}$$

$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right) + \frac{1}{2}i\int x$$

$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2(}{}$$

$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2(}{}$$

$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2(}{}$$

$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2(}{}$$

Mathematica [A] time = 0.223739, size = 141, normalized size = 0.91

$$\frac{1}{3}x^3\cot^{-1}(c+i(c+i)\tan(a+bx)) - \frac{-6b^2x^2\mathrm{PolyLog}\left(2,\frac{ie^{-2i(a+bx)}}{c}\right) + 6ibx\mathrm{PolyLog}\left(3,\frac{ie^{-2i(a+bx)}}{c}\right) + 3\mathrm{PolyLog}\left(4,\frac{ie^{-2i(a+bx)}}{c}\right.}{24b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c - (1 - I*c)*Tan[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + I*(I + c)*Tan[a + b*x]])/3 - ((4*I)*b^3*x^3*Log[1 - I/(c*E^
((2*I)*(a + b*x)))] - 6*b^2*x^2*PolyLog[2, I/(c*E^((2*I)*(a + b*x)))] + (6*
I)*b*x*PolyLog[3, I/(c*E^((2*I)*(a + b*x)))] + 3*PolyLog[4, I/(c*E^((2*I)*(
a + b*x)))])/(24*b^3)
```

Maple [C] time = 22.292, size = 1527, normalized size = 9.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c-(1-I*c)*tan(b*x+a)),x)
```

```
[Out] -1/4*I*x*polylog(3,-I*c*exp(2*I*(b*x+a)))/b^2-1/12*x^3*Pi*csgn(I*exp(2*I*(b
*x+a)))*csgn(I*(I+c)/(exp(2*I*(b*x+a))+1))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(e
xp(2*I*(b*x+a))+1))-1/12*x^3*Pi*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a
))+1))^3+1/12*x^3*Pi*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))^2+1/
12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))*csgn(exp(2*I*
(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))^2+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))
*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))^2+1/12*x^3*Pi*csgn(I*(
I+c)/(exp(2*I*(b*x+a))+1))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+
1))^2-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))^3-1/12*x^3*Pi*csgn(I/(exp(2*I*(b
*x+a))+1))*csgn(I*(I+c))*csgn(I*(I+c)/(exp(2*I*(b*x+a))+1))-1/12*x^3*Pi*csg
n(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1
))^2-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I))*csgn(I*(c*exp(2*I*(b*x+a))-
I)/(exp(2*I*(b*x+a))+1))^2+1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*
(I+c)/(exp(2*I*(b*x+a))+1))^2+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(ex
p(2*I*(b*x+a))+1))*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))+1/8*po
lylog(4,-I*c*exp(2*I*(b*x+a)))/b^3+1/4/b^3*polylog(2,-I*c*exp(2*I*(b*x+a)))
*a^2-1/2*I/b^3*a^3*ln(1-I*exp(I*(b*x+a))*(I*c)^(1/2))-1/2/b^3*a^2*dilog(1-I
*exp(I*(b*x+a))*(I*c)^(1/2))+1/12*x^3*Pi*csgn(I*(I+c))*csgn(I*(I+c)/(exp(2*
I*(b*x+a))+1))^2-1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+
1))^3-1/12*b*x^4+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a)
)+1))^3+1/6*I*x^3*ln(c*exp(2*I*(b*x+a))-I)-1/12*x^3*Pi*csgn(I*(I+c)/(exp(2*
I*(b*x+a))+1))^3-1/6*I*x^3*ln(1+I*c*exp(2*I*(b*x+a)))-1/2/b^3*a^2*dilog(1+I
*exp(I*(b*x+a))*(I*c)^(1/2))-1/6*I*x^3*ln(I+c)+1/2*I/b^2*ln(1+I*c*exp(2*I*(
b*x+a)))*x*a^2-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+
1))^3-1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(I*c)^(1/2))*x-1/2*I/b^2*a^2*ln(1
-I*exp(I*(b*x+a))*(I*c)^(1/2))*x+1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*c
sgn(I*(c*exp(2*I*(b*x+a))-I))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a
))+1))+1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))^2+1/6*
I/b^3*a^3*ln(-c*exp(2*I*(b*x+a))+I)-1/12*x^3*Pi*csgn(I*exp(I*(b*x+a)))^2*cs
gn(I*exp(2*I*(b*x+a)))-1/3*I*x^3*ln(exp(I*(b*x+a)))-1/4*x^2*polylog(2,-I*c*
exp(2*I*(b*x+a)))/b-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x
+a))+1))*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))^2-1/2*I/b^3*a^3*
ln(1+I*exp(I*(b*x+a))*(I*c)^(1/2))+1/3*I/b^3*ln(1+I*c*exp(2*I*(b*x+a)))*a^3
-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))*csgn(exp(2
*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))+1/6*x^3*Pi*csgn(I*exp(I*(b*x+a)))*c
sgn(I*exp(2*I*(b*x+a)))^2
```

Maxima [B] time = 1.13118, size = 421, normalized size = 2.72

$$-\frac{\frac{\left((bx+a)^3-3\,(bx+a)^2a+3\,(bx+a)a^2\right)\operatorname{arccot}((-i\,c+1)\tan(bx+a)-c)}{b^2}+\frac{3\left(-3i\,(bx+a)^4+12i\,(bx+a)^3a-18i\,(bx+a)^2a^2+\left(8i\,(bx+a)^3-18i\,(bx+a)^2a+18i\,(bx+a)a^2\right)\operatorname{arc}\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] -1/3*(((b*x + a)^3 - 3*(b*x + a)^2*a + 3*(b*x + a)*a^2)*arccot((-I*c + 1)*t
an(b*x + a) - c)/b^2 + 3*(-3*I*(b*x + a)^4 + 12*I*(b*x + a)^3*a - 18*I*(b*x
 + a)^2*a^2 + (8*I*(b*x + a)^3 - 18*I*(b*x + a)^2*a + 18*I*(b*x + a)*a^2)*a
rctan2(c*cos(2*b*x + 2*a), -c*sin(2*b*x + 2*a) + 1) + (-12*I*(b*x + a)^2 +
18*I*(b*x + a)*a - 9*I*a^2)*dilog(-I*c*e^(2*I*b*x + 2*I*a)) + (4*(b*x + a)^
3 - 9*(b*x + a)^2*a + 9*(b*x + a)*a^2)*log(c^2*cos(2*b*x + 2*a)^2 + c^2*sin
(2*b*x + 2*a)^2 - 2*c*sin(2*b*x + 2*a) + 1) + 3*(4*b*x + a)*polylog(3, -I*c
*e^(2*I*b*x + 2*I*a)) + 6*I*polylog(4, -I*c*e^(2*I*b*x + 2*I*a)))*(I*c - 1)
/(b^2*(12*c + 12*I)))/b
```

Fricas [C] time = 2.62011, size = 918, normalized size = 5.92

$$-\frac{b^4x^4+2i\,b^3x^3\log\left(\frac{(c+i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right)+6\,b^2x^2\mathrm{Li}_2\left(\frac{1}{2}\sqrt{-4i\,c}e^{(i\,bx+i\,a)}\right)+6\,b^2x^2\mathrm{Li}_2\left(-\frac{1}{2}\sqrt{-4i\,c}e^{(i\,bx+i\,a)}\right)-a^4-2i\,a^3\log\left(\frac{2\,ce^{(i\,bx}}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] -1/12*(b^4*x^4 + 2*I*b^3*x^3*log((c + I)*e^(2*I*b*x + 2*I*a)/(c*e^(2*I*b*x
+ 2*I*a) - I)) + 6*b^2*x^2*dilog(1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) + 6*b^2*
x^2*dilog(-1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) - a^4 - 2*I*a^3*log(1/2*(2*c*e
^(I*b*x + I*a) + I*sqrt(-4*I*c))/c) - 2*I*a^3*log(1/2*(2*c*e^(I*b*x + I*a)
- I*sqrt(-4*I*c))/c) + 12*I*b*x*polylog(3, 1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)
) + 12*I*b*x*polylog(3, -1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) - (-2*I*b^3*x^3
- 2*I*a^3)*log(1/2*sqrt(-4*I*c)*e^(I*b*x + I*a) + 1) - (-2*I*b^3*x^3 - 2*I*
a^3)*log(-1/2*sqrt(-4*I*c)*e^(I*b*x + I*a) + 1) - 12*polylog(4, 1/2*sqrt(-4
*I*c)*e^(I*b*x + I*a)) - 12*polylog(4, -1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)))/
b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c-(1-I*c)*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}\left(-(-i\,c+1)\tan\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(-(-I*c + 1)*tan(b*x + a) + c), x)
```

3.167 $\int x \cot^{-1}(c-(1-ic)\tan(a+bx))\,dx$

Optimal. Leaf size=124

$$-\frac{i\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}-\frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx))$$

```
[Out] -(b*x^3)/6 + (x^2*ArcCot[c - (1 - I*c)*Tan[a + b*x]])/2 - (I/4)*x^2*Log[1 +
 I*c*E^((2*I)*a + (2*I)*b*x)] - (x*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x
)])/(4*b) - ((I/8)*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rubi [A] time = 0.239233, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5172, 2184, 2190, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}-\frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx))$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c - (1 - I*c)*Tan[a + b*x]],x]
```

```
[Out] -(b*x^3)/6 + (x^2*ArcCot[c - (1 - I*c)*Tan[a + b*x]])/2 - (I/4)*x^2*Log[1 +
 I*c*E^((2*I)*a + (2*I)*b*x)] - (x*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x
)])/(4*b) - ((I/8)*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rule 5172

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tan[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c + I*d + c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c + I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c-(1-ic)\tan(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx)) + \frac{1}{2}(ib)\int\frac{x^2}{i(-1+ic)+c+ce^{2ia+2ibx}}\,dx$$

$$= -\frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx)) + \frac{1}{2}(bc)\int\frac{e^{2ia+2ibx}x^2}{i(-1+ic)+c+ce^{2ia+2ibx}}$$

$$= -\frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) + \frac{1}{2}i\int x$$

$$= -\frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) - \frac{x\text{Li}_2\left(-\right.}{}$$

$$= -\frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) - \frac{x\text{Li}_2\left(-\right.}{}$$

$$= -\frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) - \frac{x\text{Li}_2\left(-\right.}{}$$

Mathematica [A] time = 0.0922509, size = 111, normalized size = 0.9

$$\frac{1}{2}x^2\cot^{-1}(c+i(c+i)\tan(a+bx)) - \frac{i\left(2ibx\text{PolyLog}\left(2,\frac{ie^{-2i(a+bx)}}{c}\right)+\text{PolyLog}\left(3,\frac{ie^{-2i(a+bx)}}{c}\right)+2b^2x^2\log\left(1-\frac{ie^{-2i(a+bx)}}{c}\right)\right)}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c - (1 - I*c)*Tan[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + I*(I + c)*Tan[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 - I/(c
*E^((2*I)*(a + b*x)))] + (2*I)*b*x*PolyLog[2, I/(c*E^((2*I)*(a + b*x)))] +
PolyLog[3, I/(c*E^((2*I)*(a + b*x)))]))/b^2
```

Maple [C] time = 10.865, size = 1492, normalized size = 12.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c-(1-I*c)*tan(b*x+a)),x)
```

```
[Out] -1/2*I/b*ln(1+I*c*exp(2*I*(b*x+a)))*x*a-1/4*I*x^2*ln(I+c)-1/8*I*polylog(3,-
I*c*exp(2*I*(b*x+a)))/b^2-1/4*x*polylog(2,-I*c*exp(2*I*(b*x+a)))/b-1/8*x^2*
```

```
Pi*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))^3-1/8*x^2*Pi*csgn((c*e
xp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))^3+1/8*x^2*Pi*csgn((c*exp(2*I*(b*x+
a))-I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn
(I*(I+c))*csgn(I*(I+c)/(exp(2*I*(b*x+a))+1))+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x
+a))*(I+c)/(exp(2*I*(b*x+a))+1))*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+
a))+1))^2-1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c*exp(2*I*(b*x+a)
)-I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I))*csgn
(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))^2-1/8*x^2*Pi*csgn(I*(I+c)/(
exp(2*I*(b*x+a))+1))^3-1/4*I*x^2*ln(1+I*c*exp(2*I*(b*x+a)))-1/4/b^2*polylog
(2,-I*c*exp(2*I*(b*x+a)))*a+1/2/b^2*a*dilog(1+I*exp(I*(b*x+a))*(I*c)^(1/2))
-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*(I+c)/(exp(2*I*(b*x+a))+1))*csg
n(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))+1/2*I/b*a*ln(1+I*exp(I*(b*
x+a))*(I*c)^(1/2))*x+1/2*I/b*a*ln(1-I*exp(I*(b*x+a))*(I*c)^(1/2))*x+1/8*x^2
*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a)
)+1))^2+1/8*x^2*Pi*csgn(I*(I+c)/(exp(2*I*(b*x+a))+1))*csgn(I*exp(2*I*(b*x+a
))*(I+c)/(exp(2*I*(b*x+a))+1))^2-1/6*b*x^3+1/2/b^2*a*dilog(1-I*exp(I*(b*x+a
))*(I*c)^(1/2))+1/8*x^2*Pi*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1)
)^2-1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))*csgn((c*
exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))^2+1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b
*x+a))-I)/(exp(2*I*(b*x+a))+1))*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a
))+1))+1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(I+c)/(exp(2*I*(b*x+a
))+1))^2+1/8*x^2*Pi*csgn(I*(I+c))*csgn(I*(I+c)/(exp(2*I*(b*x+a))+1))^2+1/8*
x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))^3+1/2*I/b^2*a^2*
ln(1-I*exp(I*(b*x+a))*(I*c)^(1/2))-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)
/(exp(2*I*(b*x+a))+1))*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))-1/
8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))+1))^3-1/8*x^2*Pi*c
sgn(I*exp(2*I*(b*x+a)))^3-1/4*I/b^2*ln(1+I*c*exp(2*I*(b*x+a)))*a^2-1/4*I/b^
2*a^2*ln(-c*exp(2*I*(b*x+a))+I)+1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(I*c)^(
1/2))+1/4*I*x^2*ln(c*exp(2*I*(b*x+a))-I)-1/8*x^2*Pi*csgn(I*exp(I*(b*x+a)))^
2*csgn(I*exp(2*I*(b*x+a)))+1/4*x^2*Pi*csgn(I*exp(I*(b*x+a)))*csgn(I*exp(2*I
*(b*x+a)))^2+1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))+1))*csgn(I*(c*exp(2*I*(b*x
+a))-I))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))+1))-1/2*I*x^2*ln(e
xp(I*(b*x+a)))
```

<u>Maxima</u> [B] time = 1.1007, size = 298, normalized size = 2.4

$$-\frac{\frac{\left((bx+a)^2-2\,(bx+a)a\right)\operatorname{arccot}\left((-i\,c+1)\tan(bx+a)-c\right)}{b}+\frac{2\left(-4i\,(bx+a)^3+12i\,(bx+a)^2a-6i\,bx\operatorname{Li}_2\left(-i\,ce^{(2i\,bx+2i\,a)}\right)+\left(6i\,(bx+a)^2-12i\,(bx+a)a\right)\arctan(c\cos(2\,bx+}{}}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] -1/2*(((b*x + a)^2 - 2*(b*x + a)*a)*arccot((-I*c + 1)*tan(b*x + a) - c)/b +
 2*(-4*I*(b*x + a)^3 + 12*I*(b*x + a)^2*a - 6*I*b*x*dilog(-I*c*e^(2*I*b*x +
 2*I*a)) + (6*I*(b*x + a)^2 - 12*I*(b*x + a)*a)*arctan2(c*cos(2*b*x + 2*a),
 -c*sin(2*b*x + 2*a) + 1) + 3*((b*x + a)^2 - 2*(b*x + a)*a)*log(c^2*cos(2*b
*x + 2*a)^2 + c^2*sin(2*b*x + 2*a)^2 - 2*c*sin(2*b*x + 2*a) + 1) + 3*polylo
g(3, -I*c*e^(2*I*b*x + 2*I*a)))*(I*c - 1)/(b*(12*c + 12*I)))/b
```

Fricas [C] time = 2.57957, size = 763, normalized size = 6.15

$$-\frac{2\,b^3x^3 + 3i\,b^2x^2\log\left(\frac{(c+i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right) + 2\,a^3 + 6\,bx\mathrm{Li}_2\left(\frac{1}{2}\sqrt{-4i\,c}e^{(i\,bx+i\,a)}\right) + 6\,bx\mathrm{Li}_2\left(-\frac{1}{2}\sqrt{-4i\,c}e^{(i\,bx+i\,a)}\right) + 3i\,a^2\log\left(\frac{2\,ce^{(i\,bx+}}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] -1/12*(2*b^3*x^3 + 3*I*b^2*x^2*log((c + I)*e^(2*I*b*x + 2*I*a)/(c*e^(2*I*b*
x + 2*I*a) - I)) + 2*a^3 + 6*b*x*dilog(1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) +
6*b*x*dilog(-1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) + 3*I*a^2*log(1/2*(2*c*e^(I*
b*x + I*a) + I*sqrt(-4*I*c))/c) + 3*I*a^2*log(1/2*(2*c*e^(I*b*x + I*a) - I*
sqrt(-4*I*c))/c) - (-3*I*b^2*x^2 + 3*I*a^2)*log(1/2*sqrt(-4*I*c)*e^(I*b*x +
 I*a) + 1) - (-3*I*b^2*x^2 + 3*I*a^2)*log(-1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)
 + 1) + 6*I*polylog(3, 1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) + 6*I*polylog(3, -
1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c-(1-I*c)*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left(-(-i\,c+1)\tan\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(-(-I*c + 1)*tan(b*x + a) + c), x)
```

3.168 $\int \cot^{-1}(c-(1-ic)\tan(a+bx))\,dx$

Optimal. Leaf size=86

$$-\frac{\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}-\frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right)+x\cot^{-1}(c-(1-ic)\tan(a+bx))-\frac{bx^2}{2}$$

```
[Out] -(b*x^2)/2 + x*ArcCot[c - (1 - I*c)*Tan[a + b*x]] - (I/2)*x*Log[1 + I*c*E^(
(2*I)*a + (2*I)*b*x)] - PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rubi [A] time = 0.141577, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {5164, 2184, 2190, 2279, 2391}

$$-\frac{\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}-\frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right)+x\cot^{-1}(c-(1-ic)\tan(a+bx))-\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c - (1 - I*c)*Tan[a + b*x]],x]
```

```
[Out] -(b*x^2)/2 + x*ArcCot[c - (1 - I*c)*Tan[a + b*x]] - (I/2)*x*Log[1 + I*c*E^(
(2*I)*a + (2*I)*b*x)] - PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rule 5164

```
Int[ArcCot[(c_.) + (d_.)*Tan[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*ArcC
ot[c + d*Tan[a + b*x]], x] + Dist[I*b, Int[x/(c + I*d + c*E^(2*I*a + 2*I*b*
x)), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c + I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c-(1-ic)\tan(a+bx))\,dx = x\cot^{-1}(c-(1-ic)\tan(a+bx)) + (ib)\int \frac{x}{i(-1+ic)+c+ce^{2ia+2ibx}}\,dx$$

$$= -\frac{bx^2}{2} + x\cot^{-1}(c-(1-ic)\tan(a+bx)) + (bc)\int \frac{e^{2ia+2ibx}x}{i(-1+ic)+c+ce^{2ia+2ibx}}\,dx$$

$$= -\frac{bx^2}{2} + x\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right) + \frac{1}{2}i\int \log\Big(1$$

$$= -\frac{bx^2}{2} + x\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right) + \frac{\text{Subst}\Big(\int \frac{\mathrm{lo}}{-}}{}$$

$$= -\frac{bx^2}{2} + x\cot^{-1}(c-(1-ic)\tan(a+bx)) - \frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right) - \frac{\mathrm{Li}_2\left(-ice^{2ia}\right.}{4b}$$

Mathematica [B] time = 3.02039, size = 847, normalized size = 9.85

$$x\cot^{-1}(c+i(c+i)\tan(a+bx)) - \frac{ix\Big(-2ibx\log(2\cos(bx)(\cos(bx)-i\sin(bx))) +}{((c-i)\cos(a+bx)+i(c+i)\sin(a+bx))\left(-\frac{\log\left(\frac{1}{2}\sec(bx)(\cos(a)+i\sin(a))((ic+1)\cos(a+bx)-(c+i\right.}{\tan(bx)-i}\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c - (1 - I*c)*Tan[a + b*x]],x]
```

```
[Out] x*ArcCot[c + I*(I + c)*Tan[a + b*x]] - (I*x*((-2*I)*b*x*Log[2*Cos[b*x]*(Cos
[b*x] - I*Sin[b*x])] + Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*((-I + c)*Cos[a +
```

```
b*x] + I*(I + c)*Sin[a + b*x]))/(2*c)]*Log[1 - I*Tan[b*x]] - Log[(Sec[b*x]*
(Cos[a] + I*Sin[a])*((1 + I*c)*Cos[a + b*x] - (I + c)*Sin[a + b*x]))/2]*Log
[1 + I*Tan[b*x]] + PolyLog[2, -Cos[2*b*x] + I*Sin[2*b*x]] + PolyLog[2, (Sec
[b*x]*((I + c)*Cos[a] + (1 + I*c)*Sin[a])*(Cos[a + b*x] - I*Sin[a + b*x]))/
(2*c)] - PolyLog[2, ((Cos[a] + I*Sin[a])*((I + c)*Cos[a] + (1 + I*c)*Sin[a]
)*(-I + Tan[b*x]))/2])*Sec[a + b*x]*(Cos[b*x] + I*Sin[b*x])*(I*Cos[b*x] + S
in[b*x]))/(((-I + c)*Cos[a + b*x] + I*(I + c)*Sin[a + b*x])*(-2*b*x + I*Log
[1 - (Sec[b*x]*((I + c)*Cos[a] + (1 + I*c)*Sin[a])*(Cos[a + b*x] - I*Sin[a
+ b*x]))/(2*c)] + (I*(I + c)*Cos[a + b*x]*(Log[1 - I*Tan[b*x]] - Log[1 + I*
Tan[b*x]]))/((-I + c)*Cos[a + b*x] + I*(I + c)*Sin[a + b*x]) + ((1 + I*c)*(
Log[1 - I*Tan[b*x]] - Log[1 + I*Tan[b*x]])*Sin[a + b*x])/((-1 - I*c)*Cos[a
+ b*x] + (I + c)*Sin[a + b*x]) + (2*I)*b*x*Tan[b*x] - Log[1 - (Sec[b*x]*((I
 + c)*Cos[a] + (1 + I*c)*Sin[a])*(Cos[a + b*x] - I*Sin[a + b*x]))/(2*c)]*Ta
n[b*x] + Log[1 - I*Tan[b*x]]*Tan[b*x] - Log[1 + I*Tan[b*x]]*Tan[b*x] - (Log
[(Sec[b*x]*(Cos[a] + I*Sin[a])*((1 + I*c)*Cos[a + b*x] - (I + c)*Sin[a + b*
x]))/2]*Sec[b*x]^2)/(-I + Tan[b*x]) + (Log[1 - ((Cos[a] + I*Sin[a])*((I + c
)*Cos[a] + (1 + I*c)*Sin[a])*(-I + Tan[b*x]))/2]*Sec[b*x]^2)/(-I + Tan[b*x]
) + (Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*((-I + c)*Cos[a + b*x] + I*(I + c)*S
in[a + b*x]))/(2*c)]*Sec[b*x]^2)/(I + Tan[b*x]))*(-I + Tan[a + b*x]))
```

Maple [B] time = 0.112, size = 1681, normalized size = 19.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c-(1-I*c)*tan(b*x+a)),x)
```

```
[Out] -1/4/b/(-1+I*c)/(I+c)*ln((-1+I*c)*tan(b*x+a)+c+I)^2*c-1/2/b/(-1+I*c)/(I+c)*
dilog(-1/2*(-(-1+I*c)*tan(b*x+a)-c+I)/c)*c+1/2/b/(-1+I*c)/(I+c)*dilog((-(-1
+I*c)*tan(b*x+a)-c-I)/(-2*I-2*c))*c+1/b/(-1+I*c)*arccot(c+(-1+I*c)*tan(b*x+
a))/(2*I+2*c)*ln(-(-1+I*c)*tan(b*x+a)+c+I)-1/b/(-1+I*c)*arccot(c+(-1+I*c)*t
an(b*x+a))/(2*I+2*c)*ln((-1+I*c)*tan(b*x+a)+c+I)-1/4*I/b/(-1+I*c)/(I+c)*dil
og(-1/2*(-(-1+I*c)*tan(b*x+a)-c+I)/c)+1/4*I/b/(-1+I*c)/(I+c)*dilog((-(-1+I*
c)*tan(b*x+a)-c-I)/(-2*I-2*c))-1/4*I/b/(-1+I*c)/(I+c)*dilog(-1/2*I*((-1+I*c
)*tan(b*x+a)+c+I))-1/8*I/b/(-1+I*c)/(I+c)*ln((-1+I*c)*tan(b*x+a)+c+I)^2+1/2
/b/(-1+I*c)/(I+c)*ln(-1/2*I*(-(-1+I*c)*tan(b*x+a)-c+I))*ln((-1+I*c)*tan(b*x
+a)+c+I)*c-1/2/b/(-1+I*c)/(I+c)*dilog(-1/2*I*((-1+I*c)*tan(b*x+a)+c+I))*c+1
/4*I/b/(-1+I*c)/(I+c)*dilog(-1/2*(-(-1+I*c)*tan(b*x+a)-c+I)/c)*c^2-1/4*I/b/
(-1+I*c)/(I+c)*ln(-1/2*(-(-1+I*c)*tan(b*x+a)-c+I)/c)*ln(-(-1+I*c)*tan(b*x+a
)+c+I)-1/4*I/b/(-1+I*c)/(I+c)*dilog((-(-1+I*c)*tan(b*x+a)-c-I)/(-2*I-2*c))*
c^2-1/4*I/b/(-1+I*c)/(I+c)*ln(-1/2*I*((-1+I*c)*tan(b*x+a)+c+I))*ln(-1/2*I*(
```

```
-(-1+I*c)*tan(b*x+a)-c+I))+1/4*I/b/(-1+I*c)/(I+c)*ln(-1/2*I*(-(-1+I*c)*tan(
b*x+a)-c+I))*ln((-1+I*c)*tan(b*x+a)+c+I)-1/b/(-1+I*c)*arccot(c+(-1+I*c)*tan
(b*x+a))/(2*I+2*c)*ln(-(-1+I*c)*tan(b*x+a)+c+I)*c^2+1/b/(-1+I*c)*arccot(c+(
-1+I*c)*tan(b*x+a))/(2*I+2*c)*ln((-1+I*c)*tan(b*x+a)+c+I)*c^2-1/2/b/(-1+I*c
)/(I+c)*ln(-1/2*(-(-1+I*c)*tan(b*x+a)-c+I)/c)*ln(-(-1+I*c)*tan(b*x+a)+c+I)*
c+1/2/b/(-1+I*c)/(I+c)*ln((-(-1+I*c)*tan(b*x+a)-c-I)/(-2*I-2*c))*ln(-(-1+I*
c)*tan(b*x+a)+c+I)*c-1/2/b/(-1+I*c)/(I+c)*ln(-1/2*I*((-1+I*c)*tan(b*x+a)+c+
I))*ln(-1/2*I*(-(-1+I*c)*tan(b*x+a)-c+I))*c+1/4*I/b/(-1+I*c)/(I+c)*ln((-(-1
+I*c)*tan(b*x+a)-c-I)/(-2*I-2*c))*ln(-(-1+I*c)*tan(b*x+a)+c+I)+1/4*I/b/(-1+
I*c)/(I+c)*dilog(-1/2*I*((-1+I*c)*tan(b*x+a)+c+I))*c^2+1/8*I/b/(-1+I*c)/(I+
c)*ln((-1+I*c)*tan(b*x+a)+c+I)^2*c^2+1/4*I/b/(-1+I*c)/(I+c)*ln(-1/2*I*((-1+
I*c)*tan(b*x+a)+c+I))*ln(-1/2*I*(-(-1+I*c)*tan(b*x+a)-c+I))*c^2-1/4*I/b/(-1
+I*c)/(I+c)*ln(-1/2*I*(-(-1+I*c)*tan(b*x+a)-c+I))*ln((-1+I*c)*tan(b*x+a)+c+
I)*c^2+1/4*I/b/(-1+I*c)/(I+c)*ln(-1/2*(-(-1+I*c)*tan(b*x+a)-c+I)/c)*ln(-(-1
+I*c)*tan(b*x+a)+c+I)*c^2-1/4*I/b/(-1+I*c)/(I+c)*ln((-(-1+I*c)*tan(b*x+a)-c
-I)/(-2*I-2*c))*ln(-(-1+I*c)*tan(b*x+a)+c+I)*c^2-2*I/b/(-1+I*c)*arccot(c+(-
1+I*c)*tan(b*x+a))/(2*I+2*c)*ln(-(-1+I*c)*tan(b*x+a)+c+I)*c+2*I/b/(-1+I*c)*
arccot(c+(-1+I*c)*tan(b*x+a))/(2*I+2*c)*ln((-1+I*c)*tan(b*x+a)+c+I)*c
```

Maxima [B] time = 1.60214, size = 608, normalized size = 7.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/8*((I*c - 1)*(4*I*(b*x + a)*log((2*I*c^2 - 2*(c^2 + 2*I*c - 1)*tan(b*x +
a) + 2*I)/(2*I*c^2 - 2*(c^2 + 2*I*c - 1)*tan(b*x + a) - 4*c - 2*I))/(I*c -
1) + I*(4*(b*x + a)*(log(-I*c^2 + (c^2 + 2*I*c - 1)*tan(b*x + a) + 2*c + I)
 - log(-I*c^2 + (c^2 + 2*I*c - 1)*tan(b*x + a) - I)) + I*log(-I*c^2 + (c^2
+ 2*I*c - 1)*tan(b*x + a) + 2*c + I)^2 - 2*I*log(-I*c^2 + (c^2 + 2*I*c - 1)
*tan(b*x + a) - I)*log(1/2*(c + I)*tan(b*x + a) - 1/2*I*c + 1/2) + 2*I*log(
-I*c^2 + (c^2 + 2*I*c - 1)*tan(b*x + a) - I)*log(-1/2*((I*c - 1)*tan(b*x +
a) + c - I)/c + 1) - 2*I*log(-I*c^2 + (c^2 + 2*I*c - 1)*tan(b*x + a) + 2*c
+ I)*log(-1/2*I*tan(b*x + a) + 1/2) - 2*I*dilog(-1/2*(c + I)*tan(b*x + a) +
 1/2*I*c + 1/2) + 2*I*dilog(1/2*((I*c - 1)*tan(b*x + a) + c - I)/c) - 2*I*d
ilog(1/2*I*tan(b*x + a) + 1/2))/(I*c - 1)) - 8*(b*x + a)*arccot((-I*c + 1)*
tan(b*x + a) - c) + 4*(-I*b*x - I*a)*log((2*I*c^2 - 2*(c^2 + 2*I*c - 1)*tan
(b*x + a) + 2*I)/(2*I*c^2 - 2*(c^2 + 2*I*c - 1)*tan(b*x + a) - 4*c - 2*I)))
/b
```

Fricas [B] time = 2.59641, size = 552, normalized size = 6.42

$$-\frac{b^2x^2 + i\,bx\log\left(\frac{(c+i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right) - a^2 - (-i\,bx - i\,a)\log\left(\frac{1}{2}\sqrt{-4i\,c}e^{(i\,bx+i\,a)} + 1\right) - (-i\,bx - i\,a)\log\left(-\frac{1}{2}\sqrt{-4i\,c}e^{(i\,bx+i\,a)} + 1\right) - }{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="fricas")
```

```
[Out] -1/2*(b^2*x^2 + I*b*x*log((c + I)*e^(2*I*b*x + 2*I*a)/(c*e^(2*I*b*x + 2*I*a
) - I)) - a^2 - (-I*b*x - I*a)*log(1/2*sqrt(-4*I*c)*e^(I*b*x + I*a) + 1) -
(-I*b*x - I*a)*log(-1/2*sqrt(-4*I*c)*e^(I*b*x + I*a) + 1) - I*a*log(1/2*(2*
c*e^(I*b*x + I*a) + I*sqrt(-4*I*c))/c) - I*a*log(1/2*(2*c*e^(I*b*x + I*a) -
 I*sqrt(-4*I*c))/c) + dilog(1/2*sqrt(-4*I*c)*e^(I*b*x + I*a)) + dilog(-1/2*
sqrt(-4*I*c)*e^(I*b*x + I*a)))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c-(1-I*c)*tan(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(-(-i\,c + 1)\tan\left(bx + a\right) + c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(1-I*c)*tan(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(-(-I*c + 1)*tan(b*x + a) + c), x)
```

3.169 $\int \frac{\cot^{-1}(c-(1-ic)\tan(a+bx))}{x}\,dx$

Optimal. Leaf size=24

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c-(1-ic)\tan(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c - (1 - I*c)*Tan[a + b*x]]/x, x]
```

Rubi [A] time = 0.163922, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c-(1-ic)\tan(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c - (1 - I*c)*Tan[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c - (1 - I*c)*Tan[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c-(1-ic)\tan(a+bx))}{x}\,dx=\int \frac{\cot^{-1}(c-(1-ic)\tan(a+bx))}{x}\,dx$$

Mathematica [A] time = 0.770654, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c-(1-ic)\tan(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c - (1 - I*c)*Tan[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c - (1 - I*c)*Tan[a + b*x]]/x, x]
```

Maple [A] time = 0.407, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c-(1-ic)\tan\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c-(1-I*c)*tan(b*x+a))/x,x)
```

```
[Out] int(arccot(c-(1-I*c)*tan(b*x+a))/x,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(1-I*c)*tan(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{i\log\left(\frac{(c+i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(1-I*c)*tan(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(-1/2*I*log((c + I)*e^(2*I*b*x + 2*I*a)/(c*e^(2*I*b*x + 2*I*a) - I)
)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c-(1-I*c)*tan(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(-(-ic+1)\tan\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(1-I*c)*tan(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(-(-I*c + 1)*tan(b*x + a) + c)/x, x)
```

3.170 $\int \cot^{-1}(\cot(a+bx))\,dx$

Optimal. Leaf size=16

$$\frac{\cot^{-1}(\cot(a+bx))^2}{2b}$$

```
[Out] ArcCot[Cot[a + b*x]]^2/(2*b)
```

Rubi [A] time = 0.0128469, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2157, 30}

$$\frac{\cot^{-1}(\cot(a+bx))^2}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Cot[a + b*x]],x]
```

```
[Out] ArcCot[Cot[a + b*x]]^2/(2*b)
```

Rule 2157

```
Int[(u_)^(m_.), x_Symbol] :> With[{c = Simplify[D[u, x]]}, Dist[1/c, Subst[
Int[x^m, x], x, u], x]] /; FreeQ[m, x] && PiecewiseLinearQ[u, x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \cot^{-1}(\cot(a+bx))\,dx &= \frac{\text{Subst}\left(\int x\,dx, x, \cot^{-1}(\cot(a+bx))\right)}{b}\\ &= \frac{\cot^{-1}(\cot(a+bx))^2}{2b}\end{aligned}$$

Mathematica [A] time = 0.0062584, size = 18, normalized size = 1.12

$$x\cot^{-1}(\cot(a+bx))-\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Cot[a + b*x]],x]
```

```
[Out] -(b*x^2)/2 + x*ArcCot[Cot[a + b*x]]
```

Maple [B] time = 0.049, size = 45, normalized size = 2.8

$$\frac{1}{b}\left(-\left(\frac{\pi}{2}-\operatorname{arccot}\left(\cot\left(bx+a\right)\right)\right)\operatorname{arccot}\left(\cot\left(bx+a\right)\right)-\frac{1}{2}\left(\frac{\pi}{2}-\operatorname{arccot}\left(\cot\left(bx+a\right)\right)\right)^2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(cot(b*x+a)),x)
```

```
[Out] 1/b*(-(1/2*Pi-arccot(cot(b*x+a)))*arccot(cot(b*x+a))-1/2*(1/2*Pi-arccot(cot
(b*x+a)))^2)
```

Maxima [A] time = 0.945519, size = 14, normalized size = 0.88

$$\frac{1}{2}\,bx^2+ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(cot(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*b*x^2 + a*x
```

Fricas [A] time = 1.96274, size = 23, normalized size = 1.44

$$\frac{1}{2}x^2b+xa$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(cot(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*x^2*b + x*a
```

Sympy [A] time = 0.179973, size = 15, normalized size = 0.94

$$-\frac{bx^2}{2} + x\operatorname{acot}\left(\cot\left(a + bx\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(cot(b*x+a)),x)
```

```
[Out] -b*x**2/2 + x*acot(cot(a + b*x))
```

Giac [A] time = 1.1046, size = 14, normalized size = 0.88

$$\frac{1}{2}\,bx^2 + ax$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(cot(b*x+a)),x, algorithm="giac")
```

```
[Out] 1/2*b*x^2 + a*x
```

3.171 $\int x^2 \cot^{-1}(c + d\cot(a + bx))\,dx$

Optimal. Leaf size=399

$$-\frac{ix\text{PolyLog}\left(3,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{4b^2}+\frac{ix\text{PolyLog}\left(3,\frac{(c+i(d+1))e^{2ia+2ibx}}{c+i(1-d)}\right)}{4b^2}+\frac{\text{PolyLog}\left(4,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{8b^3}-\frac{\text{PolyLog}\left(4,\frac{(c+i(d+1}{c+i}\right.}{8b^3}$$

```
[Out] (x^3*ArcCot[c + d*Cot[a + b*x]])/3 - (I/6)*x^3*Log[1 - ((1 + I*c - d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c + d)] + (I/6)*x^3*Log[1 - ((c + I*(1 + d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 - d))] - (x^2*PolyLog[2, ((1 + I*c - d)*E^(
(2*I)*a + (2*I)*b*x))/(1 + I*c + d)])/(4*b) + (x^2*PolyLog[2, ((c + I*(1 +
d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/(4*b) - ((I/4)*x*PolyLog[3,
((1 + I*c - d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c + d)])/b^2 + ((I/4)*x*Poly
Log[3, ((c + I*(1 + d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/b^2 + Po
lyLog[4, ((1 + I*c - d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c + d)]/(8*b^3) - P
olyLog[4, ((c + I*(1 + d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))]/(8*b^3
)
```

Rubi [A] time = 0.507946, antiderivative size = 399, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5178, 2190, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{4b^2}+\frac{ix\text{PolyLog}\left(3,\frac{(c+i(d+1))e^{2ia+2ibx}}{c+i(1-d)}\right)}{4b^2}+\frac{\text{PolyLog}\left(4,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{8b^3}-\frac{\text{PolyLog}\left(4,\frac{(c+i(d+1}{c+i}\right.}{8b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + d*Cot[a + b*x]],x]
```


```
[Out] (x^3*ArcCot[c + d*Cot[a + b*x]])/3 - (I/6)*x^3*Log[1 - ((1 + I*c - d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c + d)] + (I/6)*x^3*Log[1 - ((c + I*(1 + d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 - d))] - (x^2*PolyLog[2, ((1 + I*c - d)*E^(
(2*I)*a + (2*I)*b*x))/(1 + I*c + d)])/(4*b) + (x^2*PolyLog[2, ((c + I*(1 +
d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/(4*b) - ((I/4)*x*PolyLog[3,
((1 + I*c - d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c + d)])/b^2 + ((I/4)*x*Poly
Log[3, ((c + I*(1 + d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/b^2 + Po
lyLog[4, ((1 + I*c - d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c + d)]/(8*b^3) - P
olyLog[4, ((c + I*(1 + d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))]/(8*b^3
)
```

Rule 5178

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Cot[a + b*x]])/(f*(m +
 1)), x] + (-Dist[(b*(1 + I*c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(
2*I*a + 2*I*b*x))/(1 + I*c + d - (1 + I*c - d)*E^(2*I*a + 2*I*b*x)), x], x]
 + Dist[(b*(1 - I*c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*I*a + 2*
I*b*x))/(1 - I*c - d - (1 - I*c + d)*E^(2*I*a + 2*I*b*x)), x], x]) /; FreeQ
[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && NeQ[(c - I*d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
```

```
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c+d\cot(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{3}(b(1+ic-d))\int \frac{e^{2ia+2ibx}x^3}{1+ic+d+(-1-ic+d)e^{2ia+2ibx}}$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{6}ix^3\log\left(1-\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{6}ix^3\log\left(1-\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{6}ix^3\log\left(1-\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{6}ix^3\log\left(1-\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{6}ix^3\log\left(1-\right.$$

Mathematica [A] time = 0.765992, size = 359, normalized size = 0.9

$$\frac{1}{3}x^3\cot^{-1}(d\cot(a+bx)+c) + \frac{-6b^2x^2\text{PolyLog}\left(2,\frac{(c+i(d-1))e^{2i(a+bx)}}{c-i(d+1)}\right) + 6b^2x^2\text{PolyLog}\left(2,\frac{(c+i(d+1))e^{2i(a+bx)}}{c-id+i}\right) - 6ibx\text{PolyLo}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + d*Cot[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + d*Cot[a + b*x]])/3 + ((-4*I)*b^3*x^3*Log[1 - ((c + I*(-1 +
d))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] + (4*I)*b^3*x^3*Log[1 - ((c + I*(
1 + d))*E^((2*I)*(a + b*x)))/(I + c - I*d)] - 6*b^2*x^2*PolyLog[2, ((c + I*
(-1 + d))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] + 6*b^2*x^2*PolyLog[2, ((c
+ I*(1 + d))*E^((2*I)*(a + b*x)))/(I + c - I*d)] - (6*I)*b*x*PolyLog[3, ((c
 + I*(-1 + d))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] + (6*I)*b*x*PolyLog[3,
 ((c + I*(1 + d))*E^((2*I)*(a + b*x)))/(I + c - I*d)] + 3*PolyLog[4, ((c +
I*(-1 + d))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] - 3*PolyLog[4, ((c + I*(1
```

```
 + d))*E^((2*I)*(a + b*x)))/(I + c - I*d)])/(24*b^3)
```

Maple [C] time = 8.084, size = 7900, normalized size = 19.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+d*cot(b*x+a)),x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*cot(b*x+a)),x, algorithm="maxima")

[Out] 1/6*x^3*arctan2((d + 1)*cos(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d - 1, c*co
s(2*b*x + 2*a) - (d + 1)*sin(2*b*x + 2*a) - c) - 1/6*x^3*arctan2((d - 1)*co
s(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d + 1, c*cos(2*b*x + 2*a) - (d - 1)*s
in(2*b*x + 2*a) - c) - 4*b*d*integrate(1/3*(2*(c^2 + d^2 + 1)*x^3*cos(2*b*x
 + 2*a)^2 + 2*c*d*x^3*sin(2*b*x + 2*a) + 2*(c^2 + d^2 + 1)*x^3*sin(2*b*x +
2*a)^2 - (c^2 - d^2 + 1)*x^3*cos(2*b*x + 2*a) - (2*c*d*x^3*sin(2*b*x + 2*a)
 + (c^2 - d^2 + 1)*x^3*cos(2*b*x + 2*a))*cos(4*b*x + 4*a) + (2*c*d*x^3*cos(
2*b*x + 2*a) - (c^2 - d^2 + 1)*x^3*sin(2*b*x + 2*a))*sin(4*b*x + 4*a))/(c^4
 + d^4 + 2*(c^2 - 1)*d^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*cos(4*
b*x + 4*a)^2 + 4*(c^4 + d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*cos(2*b*x + 2*a)
^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*sin(4*b*x + 4*a)^2 + 4*(c^4
+ d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*sin(2*b*x + 2*a)^2 + 2*c^2 + 2*(c^4 +
d^4 - 2*(3*c^2 + 1)*d^2 + 2*c^2 - 2*(c^4 - d^4 + 2*c^2 + 1)*cos(2*b*x + 2*a
) - 4*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1)*cos(4*b*x + 4*a) - 4*(c^4
 - d^4 + 2*c^2 + 1)*cos(2*b*x + 2*a) + 4*(2*c*d^3 - 2*(c^3 + c)*d + 2*(c*d^
3 + (c^3 + c)*d)*cos(2*b*x + 2*a) - (c^4 - d^4 + 2*c^2 + 1)*sin(2*b*x + 2*a
))*sin(4*b*x + 4*a) + 8*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1), x)
```

Fricas [C] time = 3.9963, size = 4058, normalized size = 10.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*cot(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/48*(16*b^3*x^3*arccot(d*cot(b*x + a) + c) - 6*b^2*x^2*dilog(-(c^2 + d^2 -
 (c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*
sin(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1) + 1) - 6*b^2*x^2*dilog(-(
c^2 + d^2 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I
*d^2 + I)*sin(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1) + 1) + 6*b^2*x^
2*dilog(-(c^2 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2
+ 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1) + 1)
 + 6*b^2*x^2*dilog(-(c^2 + d^2 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a)
 + (I*c^2 + 2*c*d - I*d^2 + I)*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d
 + 1) + 1) + 4*I*a^3*log(1/2*c^2 + I*c*d - 1/2*d^2 - 1/2*(c^2 + d^2 + 2*d +
 1)*cos(2*b*x + 2*a) + 1/2*(I*c^2 + I*d^2 + 2*I*d + I)*sin(2*b*x + 2*a) + 1
/2) - 4*I*a^3*log(1/2*c^2 + I*c*d - 1/2*d^2 - 1/2*(c^2 + d^2 - 2*d + 1)*cos
(2*b*x + 2*a) + 1/2*(I*c^2 + I*d^2 - 2*I*d + I)*sin(2*b*x + 2*a) + 1/2) - 4
*I*a^3*log(-1/2*c^2 + I*c*d + 1/2*d^2 + 1/2*(c^2 + d^2 + 2*d + 1)*cos(2*b*x
 + 2*a) + 1/2*(I*c^2 + I*d^2 + 2*I*d + I)*sin(2*b*x + 2*a) - 1/2) + 4*I*a^3
*log(-1/2*c^2 + I*c*d + 1/2*d^2 + 1/2*(c^2 + d^2 - 2*d + 1)*cos(2*b*x + 2*a
) + 1/2*(I*c^2 + I*d^2 - 2*I*d + I)*sin(2*b*x + 2*a) - 1/2) - 6*I*b*x*polyl
og(3, ((c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 - 2*c*d - I*d^2
+ I)*sin(2*b*x + 2*a))/(c^2 + d^2 + 2*d + 1)) + 6*I*b*x*polylog(3, ((c^2 +
2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 - 2*c*d - I*d^2 + I)*sin(2*b*x
 + 2*a))/(c^2 + d^2 - 2*d + 1)) + 6*I*b*x*polylog(3, ((c^2 - 2*I*c*d - d^2
+ 1)*cos(2*b*x + 2*a) + (-I*c^2 - 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a))/(c^2
 + d^2 + 2*d + 1)) - 6*I*b*x*polylog(3, ((c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*
x + 2*a) + (-I*c^2 - 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a))/(c^2 + d^2 - 2*d
+ 1)) + (-4*I*b^3*x^3 - 4*I*a^3)*log((c^2 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)
*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a) + 2*d + 1
)/(c^2 + d^2 + 2*d + 1)) + (4*I*b^3*x^3 + 4*I*a^3)*log((c^2 + d^2 - (c^2 -
2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)*sin(2*b*x
 + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1)) + (4*I*b^3*x^3 + 4*I*a^3)*log((c^
2 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*
d^2 - I)*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1)) + (-4*I*b^3*x^3
 - 4*I*a^3)*log((c^2 + d^2 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (
I*c^2 + 2*c*d - I*d^2 + I)*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1
)) + 3*polylog(4, ((c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 - 2*
c*d - I*d^2 + I)*sin(2*b*x + 2*a))/(c^2 + d^2 + 2*d + 1)) - 3*polylog(4, ((
c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 - 2*c*d - I*d^2 + I)*sin
```

```
(2*b*x + 2*a))/(c^2 + d^2 - 2*d + 1)) + 3*polylog(4, ((c^2 - 2*I*c*d - d^2
+ 1)*cos(2*b*x + 2*a) + (-I*c^2 - 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a))/(c^2
 + d^2 + 2*d + 1)) - 3*polylog(4, ((c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*
a) + (-I*c^2 - 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a))/(c^2 + d^2 - 2*d + 1)))
/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+d*cot(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(d \cot(bx + a) + c) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*cot(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(d*cot(b*x + a) + c), x)
```

3.172 $\int x\cot^{-1}(c+d\cot(a+bx))\,dx$

Optimal. Leaf size=303

$$-\frac{i\text{PolyLog}\left(3,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{8b^2}+\frac{i\text{PolyLog}\left(3,\frac{(c+i(d+1))e^{2ia+2ibx}}{c+i(1-d)}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{4b}+\frac{x\text{PolyLog}\left(2,\frac{(c+i(d+1}{c+i}\right.}{4b}$$

```
[Out] (x^2*ArcCot[c + d*Cot[a + b*x]])/2 - (I/4)*x^2*Log[1 - ((1 + I*c - d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c + d)] + (I/4)*x^2*Log[1 - ((c + I*(1 + d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 - d))] - (x*PolyLog[2, ((1 + I*c - d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c + d)])/(4*b) + (x*PolyLog[2, ((c + I*(1 + d))*
E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/(4*b) - ((I/8)*PolyLog[3, ((1 +
I*c - d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c + d)])/b^2 + ((I/8)*PolyLog[3, (
(c + I*(1 + d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/b^2
```

Rubi [A] time = 0.417358, antiderivative size = 303, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {5178, 2190, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{8b^2}+\frac{i\text{PolyLog}\left(3,\frac{(c+i(d+1))e^{2ia+2ibx}}{c+i(1-d)}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{4b}+\frac{x\text{PolyLog}\left(2,\frac{(c+i(d+1}{c+i}\right.}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + d*Cot[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Cot[a + b*x]])/2 - (I/4)*x^2*Log[1 - ((1 + I*c - d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c + d)] + (I/4)*x^2*Log[1 - ((c + I*(1 + d))*E^(
(2*I)*a + (2*I)*b*x))/(c + I*(1 - d))] - (x*PolyLog[2, ((1 + I*c - d)*E^((2
*I)*a + (2*I)*b*x))/(1 + I*c + d)])/(4*b) + (x*PolyLog[2, ((c + I*(1 + d))*
E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/(4*b) - ((I/8)*PolyLog[3, ((1 +
I*c - d)*E^((2*I)*a + (2*I)*b*x))/(1 + I*c + d)])/b^2 + ((I/8)*PolyLog[3, (
(c + I*(1 + d))*E^((2*I)*a + (2*I)*b*x))/(c + I*(1 - d))])/b^2
```

Rule 5178

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Cot[a + b*x]])/(f*(m +
 1)), x] + (-Dist[(b*(1 + I*c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(
2*I*a + 2*I*b*x))/(1 + I*c + d - (1 + I*c - d)*E^(2*I*a + 2*I*b*x)), x], x]
```

```
 + Dist[(b*(1 - I*c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*I*a + 2*
I*b*x))/(1 - I*c - d - (1 - I*c + d)*E^(2*I*a + 2*I*b*x)), x], x]) /; FreeQ
[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && NeQ[(c - I*d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+d\cot(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{2}(b(1+ic-d))\int \frac{e^{2ia+2ibx}x^2}{1+ic+d+(-1-ic+d)e^{2ia+2ibx}}\,d$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(c}{}\right.$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(c}{}\right.$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(c}{}\right.$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(c}{}\right.$$

Mathematica [A] time = 0.584095, size = 270, normalized size = 0.89

$$\frac{1}{2}x^2\cot^{-1}(d\cot(a+bx)+c) - \frac{i\left(-2ibx\text{PolyLog}\left(2,\frac{(c+i(d-1))e^{2i(a+bx)}}{c-i(d+1)}\right)+2ibx\text{PolyLog}\left(2,\frac{(c+i(d+1))e^{2i(a+bx)}}{c-id+i}\right)+\text{PolyLog}\left(3,\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + d*Cot[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Cot[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 - ((c + I*(-1
+ d))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] - 2*b^2*x^2*Log[1 - ((c + I*(1
+ d))*E^((2*I)*(a + b*x)))/(I + c - I*d)] - (2*I)*b*x*PolyLog[2, ((c + I*(-
1 + d))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] + (2*I)*b*x*PolyLog[2, ((c +
I*(1 + d))*E^((2*I)*(a + b*x)))/(I + c - I*d)] + PolyLog[3, ((c + I*(-1 + d
))*E^((2*I)*(a + b*x)))/(c - I*(1 + d))] - PolyLog[3, ((c + I*(1 + d))*E^((
2*I)*(a + b*x)))/(I + c - I*d)]))/b^2
```

Maple [C] time = 28.744, size = 7550, normalized size = 24.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+d*cot(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*cot(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/4*x^2*arctan2((d + 1)*cos(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d - 1, c*co
s(2*b*x + 2*a) - (d + 1)*sin(2*b*x + 2*a) - c) - 1/4*x^2*arctan2((d - 1)*co
s(2*b*x + 2*a) + c*sin(2*b*x + 2*a) + d + 1, c*cos(2*b*x + 2*a) - (d - 1)*s
in(2*b*x + 2*a) - c) - 2*b*d*integrate((2*(c^2 + d^2 + 1)*x^2*cos(2*b*x + 2
*a)^2 + 2*c*d*x^2*sin(2*b*x + 2*a) + 2*(c^2 + d^2 + 1)*x^2*sin(2*b*x + 2*a)
^2 - (c^2 - d^2 + 1)*x^2*cos(2*b*x + 2*a) - (2*c*d*x^2*sin(2*b*x + 2*a) + (
c^2 - d^2 + 1)*x^2*cos(2*b*x + 2*a))*cos(4*b*x + 4*a) + (2*c*d*x^2*cos(2*b*
x + 2*a) - (c^2 - d^2 + 1)*x^2*sin(2*b*x + 2*a))*sin(4*b*x + 4*a))/(c^4 + d
^4 + 2*(c^2 - 1)*d^2 + (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*cos(4*b*x
+ 4*a)^2 + 4*(c^4 + d^4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*cos(2*b*x + 2*a)^2 +
 (c^4 + d^4 + 2*(c^2 - 1)*d^2 + 2*c^2 + 1)*sin(4*b*x + 4*a)^2 + 4*(c^4 + d^
4 + 2*(c^2 + 1)*d^2 + 2*c^2 + 1)*sin(2*b*x + 2*a)^2 + 2*c^2 + 2*(c^4 + d^4
- 2*(3*c^2 + 1)*d^2 + 2*c^2 - 2*(c^4 - d^4 + 2*c^2 + 1)*cos(2*b*x + 2*a) -
4*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1)*cos(4*b*x + 4*a) - 4*(c^4 - d
^4 + 2*c^2 + 1)*cos(2*b*x + 2*a) + 4*(2*c*d^3 - 2*(c^3 + c)*d + 2*(c*d^3 +
(c^3 + c)*d)*cos(2*b*x + 2*a) - (c^4 - d^4 + 2*c^2 + 1)*sin(2*b*x + 2*a))*s
in(4*b*x + 4*a) + 8*(c*d^3 + (c^3 + c)*d)*sin(2*b*x + 2*a) + 1), x)
```

Fricas [C] time = 3.97339, size = 3298, normalized size = 10.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*cot(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/16*(8*b^2*x^2*arccot(d*cot(b*x + a) + c) - 2*b*x*dilog(-(c^2 + d^2 - (c^2
 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*sin(2
*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1) + 1) - 2*b*x*dilog(-(c^2 + d^2
 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)
```

```
*sin(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1) + 1) + 2*b*x*dilog(-(c^2
 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d
^2 - I)*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1) + 1) + 2*b*x*dilo
g(-(c^2 + d^2 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d
 - I*d^2 + I)*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1) + 1) - 2*I*
a^2*log(1/2*c^2 + I*c*d - 1/2*d^2 - 1/2*(c^2 + d^2 + 2*d + 1)*cos(2*b*x + 2
*a) + 1/2*(I*c^2 + I*d^2 + 2*I*d + I)*sin(2*b*x + 2*a) + 1/2) + 2*I*a^2*log
(1/2*c^2 + I*c*d - 1/2*d^2 - 1/2*(c^2 + d^2 - 2*d + 1)*cos(2*b*x + 2*a) + 1
/2*(I*c^2 + I*d^2 - 2*I*d + I)*sin(2*b*x + 2*a) + 1/2) + 2*I*a^2*log(-1/2*c
^2 + I*c*d + 1/2*d^2 + 1/2*(c^2 + d^2 + 2*d + 1)*cos(2*b*x + 2*a) + 1/2*(I*
c^2 + I*d^2 + 2*I*d + I)*sin(2*b*x + 2*a) - 1/2) - 2*I*a^2*log(-1/2*c^2 + I
*c*d + 1/2*d^2 + 1/2*(c^2 + d^2 - 2*d + 1)*cos(2*b*x + 2*a) + 1/2*(I*c^2 +
I*d^2 - 2*I*d + I)*sin(2*b*x + 2*a) - 1/2) + (-2*I*b^2*x^2 + 2*I*a^2)*log((
c^2 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d +
I*d^2 - I)*sin(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1)) + (2*I*b^2*x^
2 - 2*I*a^2)*log((c^2 + d^2 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) +
(I*c^2 + 2*c*d - I*d^2 + I)*sin(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d +
1)) + (2*I*b^2*x^2 - 2*I*a^2)*log((c^2 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)*co
s(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a) - 2*d + 1)/(
c^2 + d^2 - 2*d + 1)) + (-2*I*b^2*x^2 + 2*I*a^2)*log((c^2 + d^2 - (c^2 - 2*
I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)*sin(2*b*x +
 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1)) - I*polylog(3, ((c^2 + 2*I*c*d - d^
2 + 1)*cos(2*b*x + 2*a) + (I*c^2 - 2*c*d - I*d^2 + I)*sin(2*b*x + 2*a))/(c^
2 + d^2 + 2*d + 1)) + I*polylog(3, ((c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2
*a) + (I*c^2 - 2*c*d - I*d^2 + I)*sin(2*b*x + 2*a))/(c^2 + d^2 - 2*d + 1))
+ I*polylog(3, ((c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 - 2*c*
d + I*d^2 - I)*sin(2*b*x + 2*a))/(c^2 + d^2 + 2*d + 1)) - I*polylog(3, ((c^
2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 - 2*c*d + I*d^2 - I)*sin(
2*b*x + 2*a))/(c^2 + d^2 - 2*d + 1)))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+d*cot(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}(d\cot(bx+a)+c)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*cot(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(d*cot(b*x + a) + c), x)
```

3.173 $\int \cot^{-1}(c + d\cot(a + bx))\,dx$

Optimal. Leaf size=198

$$-\frac{\text{PolyLog}\left(2,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{4b}+\frac{\text{PolyLog}\left(2,\frac{(c+i(d+1))e^{2ia+2ibx}}{c+i(1-d)}\right)}{4b}-\frac{1}{2}ix\log\left(1-\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)+\frac{1}{2}ix\log\left(1-\frac{(c+i(}{c}\right.$$

```
[Out] x*ArcCot[c + d*Cot[a + b*x]] - (I/2)*x*Log[1 - ((1 + I*c - d)*E^((2*I)*a +
(2*I)*b*x))/(1 + I*c + d)] + (I/2)*x*Log[1 - ((c + I*(1 + d))*E^((2*I)*a +
(2*I)*b*x))/(c + I*(1 - d))] - PolyLog[2, ((1 + I*c - d)*E^((2*I)*a + (2*I)
*b*x))/(1 + I*c + d)]/(4*b) + PolyLog[2, ((c + I*(1 + d))*E^((2*I)*a + (2*I
)*b*x))/(c + I*(1 - d))]/(4*b)
```

Rubi [A] time = 0.253798, antiderivative size = 198, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {5170, 2190, 2279, 2391}

$$-\frac{\text{PolyLog}\left(2,\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)}{4b}+\frac{\text{PolyLog}\left(2,\frac{(c+i(d+1))e^{2ia+2ibx}}{c+i(1-d)}\right)}{4b}-\frac{1}{2}ix\log\left(1-\frac{(ic-d+1)e^{2ia+2ibx}}{ic+d+1}\right)+\frac{1}{2}ix\log\left(1-\frac{(c+i(}{c}\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + d*Cot[a + b*x]],x]
```


```
[Out] x*ArcCot[c + d*Cot[a + b*x]] - (I/2)*x*Log[1 - ((1 + I*c - d)*E^((2*I)*a +
(2*I)*b*x))/(1 + I*c + d)] + (I/2)*x*Log[1 - ((c + I*(1 + d))*E^((2*I)*a +
(2*I)*b*x))/(c + I*(1 - d))] - PolyLog[2, ((1 + I*c - d)*E^((2*I)*a + (2*I)
*b*x))/(1 + I*c + d)]/(4*b) + PolyLog[2, ((c + I*(1 + d))*E^((2*I)*a + (2*I
)*b*x))/(c + I*(1 - d))]/(4*b)
```


Rule 5170

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)], x_Symbol] :> Simp[x*ArcC
ot[c + d*Cot[a + b*x]], x] + (-Dist[b*(1 + I*c - d), Int[(x*E^(2*I*a + 2*I*
b*x))/(1 + I*c + d - (1 + I*c - d)*E^(2*I*a + 2*I*b*x)), x], x] + Dist[b*(1
 - I*c + d), Int[(x*E^(2*I*a + 2*I*b*x))/(1 - I*c - d - (1 - I*c + d)*E^(2*
I*a + 2*I*b*x)), x], x]) /; FreeQ[{a, b, c, d}, x] && NeQ[(c - I*d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+d\cot(a+bx))\,dx = x\cot^{-1}(c+d\cot(a+bx)) - (b(1+ic-d))\int \frac{e^{2ia+2ibx}x}{1+ic+d+(-1-ic+d)e^{2ia+2ibx}}\,dx + (b($$

$$= x\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{2}ix\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{2}ix\log\left(1-\frac{(c+i(1+}{c+i(}\right.$$

$$= x\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{2}ix\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{2}ix\log\left(1-\frac{(c+i(1+}{c+i(}\right.$$

$$= x\cot^{-1}(c+d\cot(a+bx)) - \frac{1}{2}ix\log\left(1-\frac{(1+ic-d)e^{2ia+2ibx}}{1+ic+d}\right) + \frac{1}{2}ix\log\left(1-\frac{(c+i(1+}{c+i(}\right.$$

Mathematica [B] time = 12.9836, size = 1649, normalized size = 8.33

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c + d*Cot[a + b*x]],x]
```

```
[Out] x*ArcCot[c + d*Cot[a + b*x]] - (d*(4*a*Sqrt[-d^2]*ArcTan[(c*d + Tan[a + b*x
] + c^2*Tan[a + b*x])/d] + I*d*Log[1 + I*Tan[a + b*x]]*Log[(c*d - Sqrt[-d^2
```

```
] + Tan[a + b*x] + c^2*Tan[a + b*x])/(I + I*c^2 + c*d - Sqrt[-d^2])] + I*d*
Log[1 - I*Tan[a + b*x]]*Log[(c*d + Sqrt[-d^2] + Tan[a + b*x] + c^2*Tan[a +
b*x])/(-I - I*c^2 + c*d + Sqrt[-d^2])] - I*d*Log[1 + I*Tan[a + b*x]]*Log[(c
*d + Sqrt[-d^2] + Tan[a + b*x] + c^2*Tan[a + b*x])/(I + I*c^2 + c*d + Sqrt[
-d^2])] - I*d*Log[1 - I*Tan[a + b*x]]*Log[(-(c*d) + Sqrt[-d^2] - (1 + c^2)*
Tan[a + b*x])/(I + I*c^2 - c*d + Sqrt[-d^2])] - I*d*PolyLog[2, ((1 + c^2)*(
1 - I*Tan[a + b*x]))/(1 + c^2 + I*c*d - I*Sqrt[-d^2])] + I*d*PolyLog[2, ((1
 + c^2)*(1 - I*Tan[a + b*x]))/(1 + c^2 + I*c*d + I*Sqrt[-d^2])] - I*d*PolyL
og[2, ((1 + c^2)*(1 + I*Tan[a + b*x]))/(1 + c^2 - I*c*d - I*Sqrt[-d^2])] +
I*d*PolyLog[2, ((1 + c^2)*(1 + I*Tan[a + b*x]))/(1 + c^2 - I*c*d + I*Sqrt[-
d^2])])*((2*a)/(b*(-1 - c^2 - d^2 + Cos[2*(a + b*x)] + c^2*Cos[2*(a + b*x)]
 - d^2*Cos[2*(a + b*x)] - 2*c*d*Sin[2*(a + b*x)])) - (2*(a + b*x))/(b*(-1 -
 c^2 - d^2 + Cos[2*(a + b*x)] + c^2*Cos[2*(a + b*x)] - d^2*Cos[2*(a + b*x)]
 - 2*c*d*Sin[2*(a + b*x)]))))/((d*Log[1 - ((1 + c^2)*(1 - I*Tan[a + b*x]))/
(1 + c^2 + I*c*d - I*Sqrt[-d^2])]*Sec[a + b*x]^2)/(1 - I*Tan[a + b*x]) - (d
*Log[1 - ((1 + c^2)*(1 - I*Tan[a + b*x]))/(1 + c^2 + I*c*d + I*Sqrt[-d^2])]
*Sec[a + b*x]^2)/(1 - I*Tan[a + b*x]) + (d*Log[(c*d + Sqrt[-d^2] + Tan[a +
b*x] + c^2*Tan[a + b*x])/(-I - I*c^2 + c*d + Sqrt[-d^2])]*Sec[a + b*x]^2)/(
1 - I*Tan[a + b*x]) - (d*Log[(-(c*d) + Sqrt[-d^2] - (1 + c^2)*Tan[a + b*x])
/(I + I*c^2 - c*d + Sqrt[-d^2])]*Sec[a + b*x]^2)/(1 - I*Tan[a + b*x]) - (d*
Log[1 - ((1 + c^2)*(1 + I*Tan[a + b*x]))/(1 + c^2 - I*c*d - I*Sqrt[-d^2])]*
Sec[a + b*x]^2)/(1 + I*Tan[a + b*x]) + (d*Log[1 - ((1 + c^2)*(1 + I*Tan[a +
 b*x]))/(1 + c^2 - I*c*d + I*Sqrt[-d^2])]*Sec[a + b*x]^2)/(1 + I*Tan[a + b*
x]) - (d*Log[(c*d - Sqrt[-d^2] + Tan[a + b*x] + c^2*Tan[a + b*x])/(I + I*c^
2 + c*d - Sqrt[-d^2])]*Sec[a + b*x]^2)/(1 + I*Tan[a + b*x]) + (d*Log[(c*d +
 Sqrt[-d^2] + Tan[a + b*x] + c^2*Tan[a + b*x])/(I + I*c^2 + c*d + Sqrt[-d^2
])]*Sec[a + b*x]^2)/(1 + I*Tan[a + b*x]) + (I*d*Log[1 + I*Tan[a + b*x]]*(Se
c[a + b*x]^2 + c^2*Sec[a + b*x]^2))/(c*d - Sqrt[-d^2] + Tan[a + b*x] + c^2*
Tan[a + b*x]) + (I*d*Log[1 - I*Tan[a + b*x]]*(Sec[a + b*x]^2 + c^2*Sec[a +
b*x]^2))/(c*d + Sqrt[-d^2] + Tan[a + b*x] + c^2*Tan[a + b*x]) - (I*d*Log[1
+ I*Tan[a + b*x]]*(Sec[a + b*x]^2 + c^2*Sec[a + b*x]^2))/(c*d + Sqrt[-d^2]
+ Tan[a + b*x] + c^2*Tan[a + b*x]) + (I*(1 + c^2)*d*Log[1 - I*Tan[a + b*x]]
*Sec[a + b*x]^2)/(-(c*d) + Sqrt[-d^2] - (1 + c^2)*Tan[a + b*x]) + (4*a*Sqrt
[-d^2]*(Sec[a + b*x]^2 + c^2*Sec[a + b*x]^2))/(d*(1 + (c*d + Tan[a + b*x] +
 c^2*Tan[a + b*x])^2/d^2)))
```

Maple [B] time = 0.316, size = 1160, normalized size = 5.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*cot(b*x+a)),x)
```

```
[Out] -1/2/b*arccot(c+d*cot(b*x+a))*Pi+1/b*arccot(c+d*cot(b*x+a))*arccot(cot(b*x+
a))-1/b*arctan(d*((c+d*cot(b*x+a))/d-c/d)+c)*arctan((c+d*cot(b*x+a))/d-c/d)
+1/2*I*d/b*ln(1-(I-I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d-c/d)+c))^2/((d*((c+d*
cot(b*x+a))/d-c/d)+c)^2+1)/(I*d+I-c))*arctan(d*((c+d*cot(b*x+a))/d-c/d)+c)/
(1+I*c+d)+1/2*I/b*ln(1-(I-I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d-c/d)+c))^2/((d
*((c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(I*d+I-c))*arctan(d*((c+d*cot(b*x+a))/d-c
/d)+c)/(1+I*c+d)+1/2*I/b/(-I-I*d+c)*ln(1-(I-I*d+c)*(1+I*(d*((c+d*cot(b*x+a)
)/d-c/d)+c))^2/((d*((c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(I*d+I-c))*arctan(d*((c
+d*cot(b*x+a))/d-c/d)+c)*c+1/2*d/b*arctan(d*((c+d*cot(b*x+a))/d-c/d)+c)^2/(
1+I*c+d)+1/4*d/b*polylog(2,(I-I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d-c/d)+c))^2
/((d*((c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(I*d+I-c))/(1+I*c+d)+1/2/b*arctan(d*(
(c+d*cot(b*x+a))/d-c/d)+c)^2/(1+I*c+d)+1/2/b/(-I-I*d+c)*arctan(d*((c+d*cot(
b*x+a))/d-c/d)+c)^2*c+1/4/b*polylog(2,(I-I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d
-c/d)+c))^2/((d*((c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(I*d+I-c))/(1+I*c+d)+1/4/b
/(-I-I*d+c)*polylog(2,(I-I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d-c/d)+c))^2/((d*
((c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(I*d+I-c))*c-1/2*I/b*arctan(d*((c+d*cot(b*
x+a))/d-c/d)+c)*ln(1-(I+I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d-c/d)+c))^2/((d*(
(c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(-I*d+I-c))-1/2/b*arctan(d*((c+d*cot(b*x+a)
)/d-c/d)+c)^2-1/4/b*polylog(2,(I+I*d+c)*(1+I*(d*((c+d*cot(b*x+a))/d-c/d)+c)
)^2/((d*((c+d*cot(b*x+a))/d-c/d)+c)^2+1)/(-I*d+I-c))
```

Maxima [B] time = 1.90947, size = 710, normalized size = 3.59

$$d\left(\frac{8\,(bx+a)\arctan\left(\frac{cd+\left(c^2+1\right)\tan(bx+a)}{d}\right)}{d} - \frac{8\,(bx+a)\arctan\left(\frac{cd+\left(c^2+1\right)\tan(bx+a)}{d}\right) - 4\arctan\left(cd+\left(c^2+1\right)\tan(bx+a), d\right)\arctan\left(\frac{cd+\left(c^2+d+1\right)\tan(bx+a)}{c^2+d^2+2\,d+1}, -\frac{cd\tan(bx+}{c^2+d^2}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*cot(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/8*(d*(8*(b*x + a)*arctan((c*d + (c^2 + 1)*tan(b*x + a))/d)/d - (8*(b*x +
a)*arctan((c*d + (c^2 + 1)*tan(b*x + a))/d) - 4*arctan2(c*d + (c^2 + 1)*tan
(b*x + a), d)*arctan2((c*d + (c^2 + d + 1)*tan(b*x + a))/(c^2 + d^2 + 2*d +
 1), -(c*d*tan(b*x + a) - c^2 - d - 1)/(c^2 + d^2 + 2*d + 1)) + 4*arctan2(c
*d + (c^2 + 1)*tan(b*x + a), d)*arctan2(-(c*d + (c^2 - d + 1)*tan(b*x + a))
/(c^2 + d^2 - 2*d + 1), -(c*d*tan(b*x + a) - c^2 + d - 1)/(c^2 + d^2 - 2*d
+ 1)) - (log(((c^2 + 1)*tan(b*x + a)^2 + c^2 + 1)/(c^2 + d^2 + 2*d + 1)) -
log(((c^2 + 1)*tan(b*x + a)^2 + c^2 + 1)/(c^2 + d^2 - 2*d + 1)))*log((c^2 +
```

```
 1)*d^2 + 2*(c^3 + c)*d*tan(b*x + a) + (c^4 + 2*c^2 + 1)*tan(b*x + a)^2) -
2*dilog(((I*c - 1)*tan(b*x + a) + I*d)/(c + I*d + I)) + 2*dilog(((I*c + 1)*
tan(b*x + a) + I*d)/(c + I*d - I)) + 2*dilog(-((I*c - 1)*tan(b*x + a) + I*d
)/(c - I*d + I)) - 2*dilog(-((I*c + 1)*tan(b*x + a) + I*d)/(c - I*d - I)))/
d) + 8*(b*x + a)*arccot(c + d/tan(b*x + a)) - 8*(b*x + a)*arctan((c*d + (c^
2 + 1)*tan(b*x + a))/d))/b
```

Fricas [B] time = 3.90021, size = 2508, normalized size = 12.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*cot(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/8*(8*b*x*arccot(d*cot(b*x + a) + c) + 2*I*a*log(1/2*c^2 + I*c*d - 1/2*d^2
 - 1/2*(c^2 + d^2 + 2*d + 1)*cos(2*b*x + 2*a) + 1/2*(I*c^2 + I*d^2 + 2*I*d
+ I)*sin(2*b*x + 2*a) + 1/2) - 2*I*a*log(1/2*c^2 + I*c*d - 1/2*d^2 - 1/2*(c
^2 + d^2 - 2*d + 1)*cos(2*b*x + 2*a) + 1/2*(I*c^2 + I*d^2 - 2*I*d + I)*sin(
2*b*x + 2*a) + 1/2) - 2*I*a*log(-1/2*c^2 + I*c*d + 1/2*d^2 + 1/2*(c^2 + d^2
 + 2*d + 1)*cos(2*b*x + 2*a) + 1/2*(I*c^2 + I*d^2 + 2*I*d + I)*sin(2*b*x +
2*a) - 1/2) + 2*I*a*log(-1/2*c^2 + I*c*d + 1/2*d^2 + 1/2*(c^2 + d^2 - 2*d +
 1)*cos(2*b*x + 2*a) + 1/2*(I*c^2 + I*d^2 - 2*I*d + I)*sin(2*b*x + 2*a) - 1
/2) + (-2*I*b*x - 2*I*a)*log((c^2 + d^2 - (c^2 + 2*I*c*d - d^2 + 1)*cos(2*b
*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*sin(2*b*x + 2*a) + 2*d + 1)/(c^2 +
 d^2 + 2*d + 1)) + (2*I*b*x + 2*I*a)*log((c^2 + d^2 - (c^2 - 2*I*c*d - d^2
+ 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)*sin(2*b*x + 2*a) + 2*d
+ 1)/(c^2 + d^2 + 2*d + 1)) + (2*I*b*x + 2*I*a)*log((c^2 + d^2 - (c^2 + 2*I
*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*sin(2*b*x +
 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1)) + (-2*I*b*x - 2*I*a)*log((c^2 + d^2
 - (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)
*sin(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1)) - dilog(-(c^2 + d^2 - (
c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*si
n(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1) + 1) - dilog(-(c^2 + d^2 -
(c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)*si
n(2*b*x + 2*a) + 2*d + 1)/(c^2 + d^2 + 2*d + 1) + 1) + dilog(-(c^2 + d^2 -
(c^2 + 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (-I*c^2 + 2*c*d + I*d^2 - I)*s
in(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1) + 1) + dilog(-(c^2 + d^2 -
 (c^2 - 2*I*c*d - d^2 + 1)*cos(2*b*x + 2*a) + (I*c^2 + 2*c*d - I*d^2 + I)*s
in(2*b*x + 2*a) - 2*d + 1)/(c^2 + d^2 - 2*d + 1) + 1))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*cot(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(d\cot\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*cot(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(d*cot(b*x + a) + c), x)
```

3.174 $\int \frac{\cot^{-1}(c+d\cot(a+bx))}{x}\,dx$

Optimal. Leaf size=17

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(d\cot(a+bx)+c)}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + d*Cot[a + b*x]]/x, x]
```

Rubi [A] time = 0.117841, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c+d\cot(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + d*Cot[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + d*Cot[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+d\cot(a+bx))}{x}\,dx=\int \frac{\cot^{-1}(c+d\cot(a+bx))}{x}\,dx$$

Mathematica [A] time = 0.365694, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+d\cot(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + d*Cot[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + d*Cot[a + b*x]]/x, x]
```

Maple [A] time = 0.405, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(c + d \cot(bx + a))}{x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*cot(b*x+a))/x,x)
```

```
[Out] int(arccot(c+d*cot(b*x+a))/x,x)
```

Maxima [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*cot(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] Timed out
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\operatorname{arccot}(d \cot(bx + a) + c)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*cot(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(d*cot(b*x + a) + c)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*cot(b*x+a))/x,x)
```

```
[Out] Timed out
```

<u>Giac</u> [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(d\cot\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*cot(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(d*cot(b*x + a) + c)/x, x)
```

3.175 $\int x^2 \cot^{-1}(c + (1 - ic)\cot(a + bx))\,dx$

Optimal. Leaf size=154

$$-\frac{ix\text{PolyLog}\left(3, ice^{2ia+2ibx}\right)}{4b^2} + \frac{\text{PolyLog}\left(4, ice^{2ia+2ibx}\right)}{8b^3} - \frac{x^2\text{PolyLog}\left(2, ice^{2ia+2ibx}\right)}{4b} - \frac{1}{6}ix^3\log\left(1 - ice^{2ia+2ibx}\right) + \frac{1}{3}x^3\cot$$

```
[Out] -(b*x^4)/12 + (x^3*ArcCot[c + (1 - I*c)*Cot[a + b*x]])/3 - (I/6)*x^3*Log[1
- I*c*E^((2*I)*a + (2*I)*b*x)] - (x^2*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x
)])/(4*b) - ((I/4)*x*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2 + PolyLog
[4, I*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rubi [A] time = 0.265914, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5174, 2184, 2190, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3, ice^{2ia+2ibx}\right)}{4b^2} + \frac{\text{PolyLog}\left(4, ice^{2ia+2ibx}\right)}{8b^3} - \frac{x^2\text{PolyLog}\left(2, ice^{2ia+2ibx}\right)}{4b} - \frac{1}{6}ix^3\log\left(1 - ice^{2ia+2ibx}\right) + \frac{1}{3}x^3\cot$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + (1 - I*c)*Cot[a + b*x]],x]
```

```
[Out] -(b*x^4)/12 + (x^3*ArcCot[c + (1 - I*c)*Cot[a + b*x]])/3 - (I/6)*x^3*Log[1
- I*c*E^((2*I)*a + (2*I)*b*x)] - (x^2*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x
)])/(4*b) - ((I/4)*x*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2 + PolyLog
[4, I*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rule 5174

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Cot[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - I*d - c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c - I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c+(1-ic)\cot(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) + \frac{1}{3}(ib)\int \frac{x^3}{-i(1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{3}(bc)\int \frac{e^{2ia+2ibx}x^3}{-i(1-ic)+c-ce^{2ia+2ibx}}$$
$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) + \frac{1}{2}i\int x$$
$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2\left(\right.}{}$$
$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2\left(\right.}{}$$
$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2\left(\right.}{}$$
$$= -\frac{bx^4}{12} + \frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{6}ix^3\log\left(1-ice^{2ia+2ibx}\right) - \frac{x^2\mathrm{Li}_2\left(\right.}{}$$

Mathematica [A] time = 0.196723, size = 140, normalized size = 0.91

$$\frac{1}{3}x^3\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{-6b^2x^2\mathrm{PolyLog}\left(2,-\frac{ie^{-2i(a+bx)}}{c}\right) + 6ibx\mathrm{PolyLog}\left(3,-\frac{ie^{-2i(a+bx)}}{c}\right) + 3\mathrm{PolyLog}\left(4,-\frac{ie^{-2}}{}\right.}{24b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + (1 - I*c)*Cot[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + (1 - I*c)*Cot[a + b*x]])/3 - ((4*I)*b^3*x^3*Log[1 + I/(c*E^
((2*I)*(a + b*x)))] - 6*b^2*x^2*PolyLog[2, (-I)/(c*E^((2*I)*(a + b*x)))] +
(6*I)*b*x*PolyLog[3, (-I)/(c*E^((2*I)*(a + b*x)))] + 3*PolyLog[4, (-I)/(c*E
^((2*I)*(a + b*x)))])/(24*b^3)
```

Maple [C] time = 22.095, size = 1526, normalized size = 9.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(Pi-arccot(-c-(1-I*c)*cot(b*x+a))),x)
```

```
[Out] -1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))^3+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))
*(I+c)/(exp(2*I*(b*x+a))-1))*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-
1))^2+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(e
xp(2*I*(b*x+a))-1))^2-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b
*x+a))-1))*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-1))-1/12*x^3*Pi*cs
gn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))*csgn((c*exp(2*I*(b*x+a))+
I)/(exp(2*I*(b*x+a))-1))^2-1/4*I*x*polylog(3,I*c*exp(2*I*(b*x+a)))/b^2+1/12
*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I))*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*
(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))-1/12*x^3*Pi*csgn(I*(I+c))*csgn
(I/(exp(2*I*(b*x+a))-1))*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))+1/12*x^3*Pi*csg
n(I*(I+c)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x
+a))-1))^2+1/12*x^3*Pi*csgn(I*(I+c))*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))^2+1
/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))^
2-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I))*csgn(I*(c*exp(2*I*(b*x+a))+I)/
(exp(2*I*(b*x+a))-1))^2-1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c*
exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))^2-1/12*b*x^4+1/3*I/b^3*ln(1-I*c*e
xp(2*I*(b*x+a)))*a^3+1/6*I/b^3*a^3*ln(c*exp(2*I*(b*x+a))+I)-1/2*I/b^3*a^3*l
n(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))-1/2*I/b^3*a^3*ln(1+I*exp(I*(b*x+a))*(-I*
c)^(1/2))+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))*c
sgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))-1/12*x^3*Pi*csgn(I*exp(2*I
*(b*x+a)))*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(I+c)
/(exp(2*I*(b*x+a))-1))-1/2/b^3*a^2*dilog(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))-1
/2/b^3*a^2*dilog(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))-1/4*x^2*polylog(2,I*c*exp
(2*I*(b*x+a)))/b-1/6*I*x^3*ln(I+c)+1/2*I/b^2*ln(1-I*c*exp(2*I*(b*x+a)))*x*a
^2-1/2*I/b^2*a^2*ln(1-I*exp(I*(b*x+a))*(-I*c)^(1/2))*x-1/2*I/b^2*a^2*ln(1+I
*exp(I*(b*x+a))*(-I*c)^(1/2))*x-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(
exp(2*I*(b*x+a))-1))^3-1/12*x^3*Pi*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*
x+a))-1))^3-1/12*x^3*Pi*csgn(I*exp(I*(b*x+a)))^2*csgn(I*exp(2*I*(b*x+a)))-1
/3*I*x^3*ln(exp(I*(b*x+a)))-1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*
I*(b*x+a))-1))^3+1/4/b^3*polylog(2,I*c*exp(2*I*(b*x+a)))*a^2+1/12*x^3*Pi*cs
gn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-1))^2+1/8*polylog(4,I*c*exp(2*I
*(b*x+a)))/b^3+1/12*x^3*Pi*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1)
)^2-1/6*I*x^3*ln(1-I*c*exp(2*I*(b*x+a)))+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x
+a))+I)/(exp(2*I*(b*x+a))-1))^3+1/6*I*x^3*ln(c*exp(2*I*(b*x+a))+I)-1/12*x^3
*Pi*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))^3+1/6*x^3*Pi*csgn(I*exp(I*(b*x+a)))*
csgn(I*exp(2*I*(b*x+a)))^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(pi-arccot(-c-(1-I*c)*cot(b*x+a))),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [C] time = 2.50114, size = 482, normalized size = 3.13

$$-\frac{2\,b^4x^4-8\,\pi b^3x^3-4i\,b^3x^3\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c+i}\right)+6\,b^2x^2\mathrm{Li}_2\left(i\,ce^{(2i\,bx+2i\,a)}\right)-2\,a^4-4i\,a^3\log\left(\frac{ce^{(2i\,bx+2i\,a)}+i}{c}\right)+6i\,bx\mathrm{p}}{24\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(pi-arccot(-c-(1-I*c)*cot(b*x+a))),x, algorithm="fricas")
```

```
[Out] -1/24*(2*b^4*x^4 - 8*pi*b^3*x^3 - 4*I*b^3*x^3*log((c*e^(2*I*b*x + 2*I*a) +
I)*e^(-2*I*b*x - 2*I*a)/(c + I)) + 6*b^2*x^2*dilog(I*c*e^(2*I*b*x + 2*I*a))
 - 2*a^4 - 4*I*a^3*log((c*e^(2*I*b*x + 2*I*a) + I)/c) + 6*I*b*x*polylog(3,
I*c*e^(2*I*b*x + 2*I*a)) - (-4*I*b^3*x^3 - 4*I*a^3)*log(-I*c*e^(2*I*b*x + 2
*I*a) + 1) - 3*polylog(4, I*c*e^(2*I*b*x + 2*I*a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(pi-acot(-c-(1-I*c)*cot(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int(\pi-\operatorname{arccot}(-(-i\,c+1)\cot(bx+a)-c))x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(pi-arccot(-c-(1-I*c)*cot(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate((pi - arccot(-(-I*c + 1)*cot(b*x + a) - c))*x^2, x)
```

3.176 $\int x \cot^{-1}(c+(1-ic)\cot(a+bx))\,dx$

Optimal. Leaf size=123

$$-\frac{i\text{PolyLog}\left(3,ice^{2ia+2ibx}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}-\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-$$

```
[Out] -(b*x^3)/6 + (x^2*ArcCot[c + (1 - I*c)*Cot[a + b*x]])/2 - (I/4)*x^2*Log[1 -
 I*c*E^((2*I)*a + (2*I)*b*x)] - (x*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)])
/(4*b) - ((I/8)*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rubi [A] time = 0.223926, antiderivative size = 123, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {5174, 2184, 2190, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,ice^{2ia+2ibx}\right)}{8b^2}-\frac{x\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}-\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + (1 - I*c)*Cot[a + b*x]],x]
```

```
[Out] -(b*x^3)/6 + (x^2*ArcCot[c + (1 - I*c)*Cot[a + b*x]])/2 - (I/4)*x^2*Log[1 -
 I*c*E^((2*I)*a + (2*I)*b*x)] - (x*PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)])
/(4*b) - ((I/8)*PolyLog[3, I*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rule 5174

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Cot[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - I*d - c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c - I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+(1-ic)\cot(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))+\frac{1}{2}(ib)\int\frac{x^2}{-i(1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= -\frac{bx^3}{6}+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{1}{2}(bc)\int\frac{e^{2ia+2ibx}x^2}{-i(1-ic)+c-ce^{2ia+2ibx}}\,d$$
$$= -\frac{bx^3}{6}+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)+\frac{1}{2}i\int x\,\mathrm{l}$$
$$= -\frac{bx^3}{6}+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)-\frac{x\mathrm{Li}_2\left(ic\right.}{4}$$
$$= -\frac{bx^3}{6}+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)-\frac{x\mathrm{Li}_2\left(ic\right.}{4}$$
$$= -\frac{bx^3}{6}+\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{1}{4}ix^2\log\left(1-ice^{2ia+2ibx}\right)-\frac{x\mathrm{Li}_2\left(ic\right.}{4}$$

Mathematica [A] time = 0.101451, size = 110, normalized size = 0.89

$$\frac{1}{2}x^2\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{i\left(2ibx\mathrm{PolyLog}\left(2,-\frac{ie^{-2i(a+bx)}}{c}\right)+\mathrm{PolyLog}\left(3,-\frac{ie^{-2i(a+bx)}}{c}\right)+2b^2x^2\log\left(1+\frac{ie^{-2i(a+bx)}}{c}\right)\right.}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + (1 - I*c)*Cot[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (1 - I*c)*Cot[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 + I/(c
*E^((2*I)*(a + b*x)))] + (2*I)*b*x*PolyLog[2, (-I)/(c*E^((2*I)*(a + b*x)))]
 + PolyLog[3, (-I)/(c*E^((2*I)*(a + b*x)))]))/b^2
```

Maple [C] time = 11.927, size = 1491, normalized size = 12.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(Pi-arccot(-c-(1-I*c)*cot(b*x+a))),x)
```

```
[Out] 1/2/b^2*a*dilog(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))+1/8*x^2*Pi*csgn(exp(2*I*(b
*x+a))*(I+c)/(exp(2*I*(b*x+a))-1))^2-1/4*I*x^2*ln(I+c)+1/4*I*x^2*ln(c*exp(2
```

```
*I*(b*x+a))+I)+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-1
))*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-1))^2-1/8*x^2*Pi*csgn(I*(c
*exp(2*I*(b*x+a))+I))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))^2
-1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp
(2*I*(b*x+a))-1))^2+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b*x
+a))*(I+c)/(exp(2*I*(b*x+a))-1))^2+1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)
)*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+
a))-1))-1/8*x^2*Pi*csgn(I*(I+c))*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(I+c)/
(exp(2*I*(b*x+a))-1))+1/8*x^2*Pi*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+
a))-1))^2+1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))^3-
1/6*b*x^3-1/4*x*polylog(2,I*c*exp(2*I*(b*x+a)))/b-1/4*I*x^2*ln(1-I*c*exp(2*
I*(b*x+a)))-1/8*I*polylog(3,I*c*exp(2*I*(b*x+a)))/b^2-1/8*x^2*Pi*csgn(exp(2
*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-1))^3-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)
)*(I+c)/(exp(2*I*(b*x+a))-1))*csgn(exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))
-1))-1/8*x^2*Pi*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))^3+1/8*x^2
*Pi*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(exp(2
*I*(b*x+a))-1))^2-1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a)
)-1))*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1))^2-1/8*x^2*Pi*csgn(I
*exp(2*I*(b*x+a))*(I+c)/(exp(2*I*(b*x+a))-1))^3-1/8*x^2*Pi*csgn(I*exp(2*I*(
b*x+a)))*csgn(I*(I+c)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(I+c)/(
exp(2*I*(b*x+a))-1))+1/8*x^2*Pi*csgn(I*(I+c))*csgn(I*(I+c)/(exp(2*I*(b*x+a)
)-1))^2+1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(I+c)/(exp(2*I*(b*x+
a))-1))^2-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))^3+1/2*I/b^2*a^2*ln(1-I*exp(I*
(b*x+a))*(-I*c)^(1/2))+1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))-1/
4*I/b^2*ln(1-I*c*exp(2*I*(b*x+a)))*a^2+1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a)
)+I)/(exp(2*I*(b*x+a))-1))*csgn((c*exp(2*I*(b*x+a))+I)/(exp(2*I*(b*x+a))-1)
)-1/4*I/b^2*a^2*ln(c*exp(2*I*(b*x+a))+I)-1/8*x^2*Pi*csgn(I*(I+c)/(exp(2*I*(
b*x+a))-1))^3-1/4/b^2*polylog(2,I*c*exp(2*I*(b*x+a)))*a+1/2/b^2*a*dilog(1-I
*exp(I*(b*x+a))*(-I*c)^(1/2))-1/8*x^2*Pi*csgn(I*exp(I*(b*x+a)))^2*csgn(I*ex
p(2*I*(b*x+a)))+1/4*x^2*Pi*csgn(I*exp(I*(b*x+a)))*csgn(I*exp(2*I*(b*x+a)))^
2-1/2*I/b*ln(1-I*c*exp(2*I*(b*x+a)))*x*a+1/2*I/b*a*ln(1-I*exp(I*(b*x+a))*(-
I*c)^(1/2))*x+1/2*I/b*a*ln(1+I*exp(I*(b*x+a))*(-I*c)^(1/2))*x-1/2*I*x^2*ln(
exp(I*(b*x+a)))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-arccot(-c-(1-I*c)*cot(b*x+a))),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [C] time = 2.5275, size = 419, normalized size = 3.41

$$-\frac{4\,b^3x^3-12\,\pi b^2x^2-6i\,b^2x^2\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c+i}\right)+4\,a^3+6\,bx\mathrm{Li}_2\left(i\,ce^{(2i\,bx+2i\,a)}\right)+6i\,a^2\log\left(\frac{ce^{(2i\,bx+2i\,a)}+i}{c}\right)-\left(-6i\,b^2\right.}{24\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-arccot(-c-(1-I*c)*cot(b*x+a))),x, algorithm="fricas")
```

```
[Out] -1/24*(4*b^3*x^3 - 12*pi*b^2*x^2 - 6*I*b^2*x^2*log((c*e^(2*I*b*x + 2*I*a) +
 I)*e^(-2*I*b*x - 2*I*a)/(c + I)) + 4*a^3 + 6*b*x*dilog(I*c*e^(2*I*b*x + 2*
I*a)) + 6*I*a^2*log((c*e^(2*I*b*x + 2*I*a) + I)/c) - (-6*I*b^2*x^2 + 6*I*a^
2)*log(-I*c*e^(2*I*b*x + 2*I*a) + 1) + 3*I*polylog(3, I*c*e^(2*I*b*x + 2*I*
a)))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-acot(-c-(1-I*c)*cot(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int(\pi-\operatorname{arccot}\left(-(-i\,c+1)\cot\left(bx+a\right)-c\right))x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-arccot(-c-(1-I*c)*cot(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate((pi - arccot(-(-I*c + 1)*cot(b*x + a) - c))*x, x)
```

3.177 $\int \cot^{-1}(c+(1-ic)\cot(a+bx))\,dx$

Optimal. Leaf size=85

$$-\frac{\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}-\frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right)+x\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{bx^2}{2}$$

```
[Out] -(b*x^2)/2 + x*ArcCot[c + (1 - I*c)*Cot[a + b*x]] - (I/2)*x*Log[1 - I*c*E^(
(2*I)*a + (2*I)*b*x)] - PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rubi [A] time = 0.135915, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294, Rules used = {5166, 2184, 2190, 2279, 2391}

$$-\frac{\text{PolyLog}\left(2,ice^{2ia+2ibx}\right)}{4b}-\frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right)+x\cot^{-1}(c+(1-ic)\cot(a+bx))-\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + (1 - I*c)*Cot[a + b*x]],x]
```

```
[Out] -(b*x^2)/2 + x*ArcCot[c + (1 - I*c)*Cot[a + b*x]] - (I/2)*x*Log[1 - I*c*E^(
(2*I)*a + (2*I)*b*x)] - PolyLog[2, I*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rule 5166

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)], x_Symbol] :> Simp[x*ArcC
ot[c + d*Cot[a + b*x]], x] + Dist[I*b, Int[x/(c - I*d - c*E^(2*I*a + 2*I*b*
x)), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c - I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+(1-ic)\cot(a+bx))\,dx = x\cot^{-1}(c+(1-ic)\cot(a+bx)) + (ib)\int \frac{x}{-i(1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= -\frac{bx^2}{2} + x\cot^{-1}(c+(1-ic)\cot(a+bx)) - (bc)\int \frac{e^{2ia+2ibx}x}{-i(1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= -\frac{bx^2}{2} + x\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right) + \frac{1}{2}i\int \log\left(1-\right.$$
$$= -\frac{bx^2}{2} + x\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right) + \frac{\text{Subst}\left(\int \frac{\log(}{}\right.}{}$$
$$= -\frac{bx^2}{2} + x\cot^{-1}(c+(1-ic)\cot(a+bx)) - \frac{1}{2}ix\log\left(1-ice^{2ia+2ibx}\right) - \frac{\text{Li}_2\left(ice^{2ia+2ib}\right.}{4b}$$

Mathematica [B] time = 5.24344, size = 929, normalized size = 10.93

$$\frac{ix\left(2\right.}{(\cot(a+bx)+i)(ic+(c+i)\cot(a+bx)+1)\left(i\log(i\tan(bx)+1)\tan(bx)\cos^2(a)+2ibx+\log\left(1-\frac{\sec(bx)((c-i)\cos(a)+i(c+i)}{}\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c + (1 - I*c)*Cot[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (1 - I*c)*Cot[a + b*x]] + (I*x*Csc[a + b*x]^2*(2*b*x*Log[2*Cos
[b*x]*(Cos[b*x] - I*Sin[b*x])] + I*Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*((I +
```

```
c)*Cos[a + b*x] + (1 + I*c)*Sin[a + b*x]))/(2*c)]*Log[1 - I*Tan[b*x]] - I*L
og[(Sec[b*x]*((1 - I*c)*Cos[a + b*x] + (-I + c)*Sin[a + b*x]))/(2*Cos[a] -
(2*I)*Sin[a])]*Log[1 + I*Tan[b*x]] + I*PolyLog[2, -Cos[2*b*x] + I*Sin[2*b*x
]] + I*PolyLog[2, (Sec[b*x]*((-I + c)*Cos[a] + I*(I + c)*Sin[a])*(Cos[a + b
*x] - I*Sin[a + b*x]))/(2*c)] - I*PolyLog[2, (Sec[b*x]*((1 + I*c)*Cos[a] -
(I + c)*Sin[a])*(Cos[a + b*x] + I*Sin[a + b*x]))/2])*(Cos[b*x] - I*Sin[b*x]
)*(Cos[b*x] + I*Sin[b*x]))/((I + Cot[a + b*x])*(1 + I*c + (I + c)*Cot[a + b
*x])*((2*I)*b*x + Log[1 - (Sec[b*x]*((-I + c)*Cos[a] + I*(I + c)*Sin[a])*(C
os[a + b*x] - I*Sin[a + b*x]))/(2*c)] + Log[1 + (Sec[b*x]*((-1 - I*c)*Cos[a
] + (I + c)*Sin[a])*(Cos[a + b*x] + I*Sin[a + b*x]))/2] + ((-I + c)*Cos[a +
 b*x]*(Log[1 - I*Tan[b*x]] - Log[1 + I*Tan[b*x]]))/((I + c)*Cos[a + b*x] +
(1 + I*c)*Sin[a + b*x]) + ((I + c)*(Log[1 - I*Tan[b*x]] - Log[1 + I*Tan[b*x
]])*Sin[a + b*x])/((1 - I*c)*Cos[a + b*x] + (-I + c)*Sin[a + b*x]) + 2*b*x*
Tan[b*x] + I*Log[1 - (Sec[b*x]*((-I + c)*Cos[a] + I*(I + c)*Sin[a])*(Cos[a
+ b*x] - I*Sin[a + b*x]))/(2*c)]*Tan[b*x] - I*Log[1 + (Sec[b*x]*((-1 - I*c)
*Cos[a] + (I + c)*Sin[a])*(Cos[a + b*x] + I*Sin[a + b*x]))/2]*Tan[b*x] - I*
Log[1 - I*Tan[b*x]]*Tan[b*x] + I*Cos[a]^2*Log[1 + I*Tan[b*x]]*Tan[b*x] + I*
Log[1 + I*Tan[b*x]]*Sin[a]^2*Tan[b*x] + (I*Log[(Sec[b*x]*((1 - I*c)*Cos[a +
 b*x] + (-I + c)*Sin[a + b*x]))/(2*Cos[a] - (2*I)*Sin[a])]*Sec[b*x]^2)/(-I
+ Tan[b*x]) - (I*Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*((I + c)*Cos[a + b*x] +
(1 + I*c)*Sin[a + b*x]))/(2*c)]*Sec[b*x]^2)/(I + Tan[b*x])))
```

Maple [B] time = 0.116, size = 1498, normalized size = 17.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(Pi-arccot(-c-(1-I*c)*cot(b*x+a)),x)
```

```
[Out] Pi*x+1/2/b/(-1+I*c)/(I+c)*dilog(-1/2*I*(cot(b*x+a)*(-1+I*c)-c+I))*c+1/2/b/(
-1+I*c)/(I+c)*dilog((cot(b*x+a)*(-1+I*c)-c-I)/(-2*I-2*c))*c-1/b/(-1+I*c)*ar
ccot(cot(b*x+a)*(-1+I*c)-c)/(2*I+2*c)*ln(cot(b*x+a)*(-1+I*c)+c+I)+1/b/(-1+I
*c)*arccot(cot(b*x+a)*(-1+I*c)-c)/(2*I+2*c)*ln(cot(b*x+a)*(-1+I*c)-c-I)-1/8
*I/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)-c-I)^2-1/4*I/b/(-1+I*c)/(I+c)*di
log(-1/2*(cot(b*x+a)*(-1+I*c)-c+I)/c)+1/4*I/b/(-1+I*c)/(I+c)*dilog((cot(b*x
+a)*(-1+I*c)-c-I)/(-2*I-2*c))+1/4*I/b/(-1+I*c)/(I+c)*dilog(-1/2*I*(cot(b*x+
a)*(-1+I*c)-c+I))-1/4/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)-c-I)^2*c-1/2/
b/(-1+I*c)/(I+c)*dilog(-1/2*(cot(b*x+a)*(-1+I*c)-c+I)/c)*c+1/4*I/b/(-1+I*c)
/(I+c)*ln(-1/2*I*(cot(b*x+a)*(-1+I*c)-c+I))*ln(cot(b*x+a)*(-1+I*c)-c-I)-1/4
*I/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*ln(-1/2*(cot(b*x+a)*(-1+I*c
)-c+I)/c)+1/4*I/b/(-1+I*c)/(I+c)*dilog(-1/2*(cot(b*x+a)*(-1+I*c)-c+I)/c)*c^
```

```
2-1/4*I/b/(-1+I*c)/(I+c)*dilog((cot(b*x+a)*(-1+I*c)-c-I)/(-2*I-2*c))*c^2+1/
4*I/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*ln((cot(b*x+a)*(-1+I*c)-c-
I)/(-2*I-2*c))+1/8*I/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)-c-I)^2*c^2-1/4
*I/b/(-1+I*c)/(I+c)*ln(-1/2*I*(cot(b*x+a)*(-1+I*c)-c+I))*ln(cot(b*x+a)*(-1+
I*c)-c-I)*c^2+1/4*I/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*ln(-1/2*(c
ot(b*x+a)*(-1+I*c)-c+I)/c)*c^2-1/4*I/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c
)+c+I)*ln((cot(b*x+a)*(-1+I*c)-c-I)/(-2*I-2*c))*c^2+2*I/b/(-1+I*c)*arccot(c
ot(b*x+a)*(-1+I*c)-c)/(2*I+2*c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*c-2*I/b/(-1+I*c
)*arccot(cot(b*x+a)*(-1+I*c)-c)/(2*I+2*c)*ln(cot(b*x+a)*(-1+I*c)-c-I)*c+1/2
/b/(-1+I*c)/(I+c)*ln(-1/2*I*(cot(b*x+a)*(-1+I*c)-c+I))*ln(cot(b*x+a)*(-1+I*
c)-c-I)*c-1/2/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*ln(-1/2*(cot(b*x
+a)*(-1+I*c)-c+I)/c)*c+1/2/b/(-1+I*c)/(I+c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*ln(
(cot(b*x+a)*(-1+I*c)-c-I)/(-2*I-2*c))*c+1/b/(-1+I*c)*arccot(cot(b*x+a)*(-1+
I*c)-c)/(2*I+2*c)*ln(cot(b*x+a)*(-1+I*c)+c+I)*c^2-1/b/(-1+I*c)*arccot(cot(b
*x+a)*(-1+I*c)-c)/(2*I+2*c)*ln(cot(b*x+a)*(-1+I*c)-c-I)*c^2-1/4*I/b/(-1+I*c
)/(I+c)*dilog(-1/2*I*(cot(b*x+a)*(-1+I*c)-c+I))*c^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-arccot(-c-(1-I*c)*cot(b*x+a)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.50861, size = 327, normalized size = 3.85

$$-\frac{2\,b^2x^2-4\,\pi bx-2i\,bx\log\left(\frac{\left(ce^{(2i\,bx+2i\,a)}+i\right)e^{(-2i\,bx-2i\,a)}}{c+i}\right)-2\,a^2-(-2i\,bx-2i\,a)\log\left(-i\,ce^{(2i\,bx+2i\,a)}+1\right)-2i\,a\log\left(\frac{ce^{(2i\,bx+2i\,a)}+i}{c}\right)}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-arccot(-c-(1-I*c)*cot(b*x+a)),x, algorithm="fricas")
```

```
[Out] -1/4*(2*b^2*x^2 - 4*pi*b*x - 2*I*b*x*log((c*e^(2*I*b*x + 2*I*a) + I)*e^(-2*
I*b*x - 2*I*a)/(c + I)) - 2*a^2 - (-2*I*b*x - 2*I*a)*log(-I*c*e^(2*I*b*x +
2*I*a) + 1) - 2*I*a*log((c*e^(2*I*b*x + 2*I*a) + I)/c) + dilog(I*c*e^(2*I*b
```

```
*x + 2*I*a)))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-acot(-c-(1-I*c)*cot(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \pi - \operatorname{arccot}\left(-(-i\,c+1)\cot\left(bx+a\right)-c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-arccot(-c-(1-I*c)*cot(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(pi - arccot(-(-I*c + 1)*cot(b*x + a) - c), x)
```

3.178 $\int \frac{\cot^{-1}(c+(1-ic)\cot(a+bx))}{x}\,dx$

Optimal. Leaf size=23

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c+(1-ic)\cot(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + (1 - I*c)*Cot[a + b*x]]/x, x]
```

Rubi [A] time = 0.113958, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c+(1-ic)\cot(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + (1 - I*c)*Cot[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + (1 - I*c)*Cot[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+(1-ic)\cot(a+bx))}{x}\,dx=\int \frac{\cot^{-1}(c+(1-ic)\cot(a+bx))}{x}\,dx$$

Mathematica [A] time = 0.365223, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+(1-ic)\cot(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + (1 - I*c)*Cot[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + (1 - I*c)*Cot[a + b*x]]/x, x]
```

Maple [A] time = 0.418, size = 0, normalized size = 0.

$$\int \frac{\pi - \operatorname{arccot}\left(-c - (1 - ic)\cot\left(bx + a\right)\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((Pi-arccot(-c-(1-I*c)*cot(b*x+a)))/x,x)
```

```
[Out] int((Pi-arccot(-c-(1-I*c)*cot(b*x+a)))/x,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-arccot(-c-(1-I*c)*cot(b*x+a)))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{2\,\pi + i\,\log\left(\frac{\left(ce^{\left(2i\,bx+2i\,a\right)}+i\right)e^{\left(-2i\,bx-2i\,a\right)}}{c+i}\right)}{2\,x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-arccot(-c-(1-I*c)*cot(b*x+a)))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*pi + I*log((c*e^(2*I*b*x + 2*I*a) + I)*e^(-2*I*b*x - 2*I*a)
/(c + I)))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-acot(-c-(1-I*c)*cot(b*x+a)))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\pi - \operatorname{arccot}\left(-(-i\,c+1)\cot\left(bx+a\right)-c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-arccot(-c-(1-I*c)*cot(b*x+a)))/x,x, algorithm="giac")
```

```
[Out] integrate((pi - arccot(-(-I*c + 1)*cot(b*x + a) - c))/x, x)
```

3.179 $\int x^2 \cot^{-1}(c-(1+ic)\cot(a+bx))\,dx$

Optimal. Leaf size=155

$$\frac{ix\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{4b^2}-\frac{\text{PolyLog}\left(4,-ice^{2ia+2ibx}\right)}{8b^3}+\frac{x^2\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{3}x^3$$

```
[Out] (b*x^4)/12 + (x^3*ArcCot[c - (1 + I*c)*Cot[a + b*x]])/3 + (I/6)*x^3*Log[1 +
 I*c*E^((2*I)*a + (2*I)*b*x)] + (x^2*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b
*x)])/(4*b) + ((I/4)*x*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2 - Po
lyLog[4, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```

Rubi [A] time = 0.256928, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {5174, 2184, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{4b^2}-\frac{\text{PolyLog}\left(4,-ice^{2ia+2ibx}\right)}{8b^3}+\frac{x^2\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{3}x^3$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c - (1 + I*c)*Cot[a + b*x]],x]
```


```
[Out] (b*x^4)/12 + (x^3*ArcCot[c - (1 + I*c)*Cot[a + b*x]])/3 + (I/6)*x^3*Log[1 +
 I*c*E^((2*I)*a + (2*I)*b*x)] + (x^2*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b
*x)])/(4*b) + ((I/4)*x*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2 - Po
lyLog[4, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(8*b^3)
```


Rule 5174

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Cot[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - I*d - c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c - I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c-(1+ic)\cot(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{3}(ib)\int\frac{x^3}{-i(-1-ic)+c-ce^{2ia+2ibx}}\,dx$$

$$=\frac{bx^4}{12}+\frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{3}(bc)\int\frac{e^{2ia+2ibx}x^3}{-i(-1-ic)+c-ce^{2ia+2il}}$$

$$=\frac{bx^4}{12}+\frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)-\frac{1}{2}i\int x$$

$$=\frac{bx^4}{12}+\frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{x^2\mathrm{Li}_2}{}$$

$$=\frac{bx^4}{12}+\frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{x^2\mathrm{Li}_2}{}$$

$$=\frac{bx^4}{12}+\frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{x^2\mathrm{Li}_2}{}$$

$$=\frac{bx^4}{12}+\frac{1}{3}x^3\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{1}{6}ix^3\log\left(1+ice^{2ia+2ibx}\right)+\frac{x^2\mathrm{Li}_2}{}$$

Mathematica [A] time = 0.201403, size = 136, normalized size = 0.88

$$\frac{1}{24}\left(\frac{6ix\mathrm{PolyLog}\left(3,\frac{ie^{-2i(a+bx)}}{c}\right)}{b^2}+\frac{3\mathrm{PolyLog}\left(4,\frac{ie^{-2i(a+bx)}}{c}\right)}{b^3}-\frac{6x^2\mathrm{PolyLog}\left(2,\frac{ie^{-2i(a+bx)}}{c}\right)}{b}+4ix^3\log\left(1-\frac{ie^{-2i(a+bx)}}{c}\right)+8x^3\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c - (1 + I*c)*Cot[a + b*x]],x]
```

```
[Out] (8*x^3*ArcCot[c + (-1 - I*c)*Cot[a + b*x]] + (4*I)*x^3*Log[1 - I/(c*E^((2*I
)*(a + b*x)))] - (6*x^2*PolyLog[2, I/(c*E^((2*I)*(a + b*x)))])/b + ((6*I)*x
*PolyLog[3, I/(c*E^((2*I)*(a + b*x)))])/b^2 + (3*PolyLog[4, I/(c*E^((2*I)*(
a + b*x)))])/b^3)/24
```

Maple [C] time = 22.102, size = 1527, normalized size = 9.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(Pi-arccot(-c+(1+I*c)*cot(b*x+a))),x)
```

```
[Out] 1/6*I*x^3*ln(1+I*c*exp(2*I*(b*x+a)))+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))^3
-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))*csgn((c*ex
p(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))-1/8*polylog(4,-I*c*exp(2*I*(b*x+a))
)/b^3-1/4/b^3*polylog(2,-I*c*exp(2*I*(b*x+a)))*a^2-1/12*x^3*Pi*csgn(I*exp(2
*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*
I*(b*x+a))-1))^2+1/2/b^3*a^2*dilog(1-I*exp(I*(b*x+a))*(I*c)^(1/2))-1/6*I/b^
3*a^3*ln(-c*exp(2*I*(b*x+a))+I)+1/2*I/b^3*a^3*ln(1+I*exp(I*(b*x+a))*(I*c)^(
1/2))+1/2*I/b^3*a^3*ln(1-I*exp(I*(b*x+a))*(I*c)^(1/2))-1/3*I/b^3*ln(1+I*c*e
xp(2*I*(b*x+a)))*a^3-1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b
*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))^2-1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))
-I))*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b
*x+a))-1))+1/12*b*x^4+1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c*ex
p(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^2+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*
x+a))-I))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^2-1/12*x^3*Pi
*csgn(I*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*
(b*x+a))-1))^2-1/12*x^3*Pi*csgn(I*(c-I))*csgn(I*(c-I)/(exp(2*I*(b*x+a))-1))
^2-1/12*x^3*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c-I)/(exp(2*I*(b*x+a))-
1))^2+1/12*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))*csgn(
(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^2+1/4*I*x*polylog(3,-I*c*exp(2
*I*(b*x+a)))/b^2+1/12*x^3*Pi*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-
1))^2+1/2/b^3*a^2*dilog(1+I*exp(I*(b*x+a))*(I*c)^(1/2))+1/12*x^3*Pi*csgn(I*
exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(exp(2*I*(b*x+a))*(c-I)/(e
xp(2*I*(b*x+a))-1))+1/12*x^3*Pi*csgn(I*(c-I))*csgn(I/(exp(2*I*(b*x+a))-1))*
csgn(I*(c-I)/(exp(2*I*(b*x+a))-1))-1/2*I/b^2*ln(1+I*c*exp(2*I*(b*x+a)))*x*a
^2+1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(I*c)^(1/2))*x+1/2*I/b^2*a^2*ln(1-I*
exp(I*(b*x+a))*(I*c)^(1/2))*x+1/6*I*x^3*ln(c-I)+1/3*I*x^3*ln(exp(I*(b*x+a))
)+1/12*x^3*Pi*csgn(I*exp(I*(b*x+a)))^2*csgn(I*exp(2*I*(b*x+a)))+1/4*x^2*pol
ylog(2,-I*c*exp(2*I*(b*x+a)))/b+1/12*x^3*Pi*csgn(I*(c-I)/(exp(2*I*(b*x+a))-
1))^3+1/12*x^3*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))^3-1/1
2*x^3*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^3-1/6*I*x^3*ln
(c*exp(2*I*(b*x+a))-I)-1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*
x+a))-1))^3+1/12*x^3*Pi*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))^2
-1/12*x^3*Pi*csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^3+1/12*x^3*P
i*csgn(I*exp(2*I*(b*x+a)))*csgn(I*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*
I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))-1/6*x^3*Pi*csgn(I*exp(I*(b*x+a)))*cs
gn(I*exp(2*I*(b*x+a)))^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(pi-arccot(-c+(1+I*c)*cot(b*x+a))),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [C] time = 2.67434, size = 481, normalized size = 3.1

$$\frac{2\,b^4x^4 + 8\,\pi b^3x^3 + 4i\,b^3x^3\log\left(\frac{(c-i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right) + 6\,b^2x^2\mathrm{Li}_2\left(-i\,ce^{(2i\,bx+2i\,a)}\right) - 2\,a^4 - 4i\,a^3\log\left(\frac{ce^{(2i\,bx+2i\,a)}-i}{c}\right) + 6i\,bx\mathrm{polylog}}{24\,b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(pi-arccot(-c+(1+I*c)*cot(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/24*(2*b^4*x^4 + 8*pi*b^3*x^3 + 4*I*b^3*x^3*log((c - I)*e^(2*I*b*x + 2*I*a
)/(c*e^(2*I*b*x + 2*I*a) - I)) + 6*b^2*x^2*dilog(-I*c*e^(2*I*b*x + 2*I*a))
- 2*a^4 - 4*I*a^3*log((c*e^(2*I*b*x + 2*I*a) - I)/c) + 6*I*b*x*polylog(3, -
I*c*e^(2*I*b*x + 2*I*a)) + (4*I*b^3*x^3 + 4*I*a^3)*log(I*c*e^(2*I*b*x + 2*I
*a) + 1) - 3*polylog(4, -I*c*e^(2*I*b*x + 2*I*a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(pi-acot(-c+(1+I*c)*cot(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (\pi - \operatorname{arccot}\left((i\,c+1)\cot\left(bx+a\right)-c\right))x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(pi-arccot(-c+(1+I*c)*cot(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate((pi - arccot((I*c + 1)*cot(b*x + a) - c))*x^2, x)
```

3.180 $\int x \cot^{-1}(c-(1+ic)\cot(a+bx))\,dx$

Optimal. Leaf size=124

$$\frac{i\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{8b^2}+\frac{x\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)$$

```
[Out] (b*x^3)/6 + (x^2*ArcCot[c - (1 + I*c)*Cot[a + b*x]])/2 + (I/4)*x^2*Log[1 +
I*c*E^((2*I)*a + (2*I)*b*x)] + (x*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x)
])/(4*b) + ((I/8)*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rubi [A] time = 0.219299, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5174, 2184, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3,-ice^{2ia+2ibx}\right)}{8b^2}+\frac{x\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c - (1 + I*c)*Cot[a + b*x]],x]
```

```
[Out] (b*x^3)/6 + (x^2*ArcCot[c - (1 + I*c)*Cot[a + b*x]])/2 + (I/4)*x^2*Log[1 +
I*c*E^((2*I)*a + (2*I)*b*x)] + (x*PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x)
])/(4*b) + ((I/8)*PolyLog[3, (-I)*c*E^((2*I)*a + (2*I)*b*x)])/b^2
```

Rule 5174

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_.
), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Cot[a + b*x]])/(f*(m +
 1)), x] + Dist[(I*b)/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - I*d - c*E^(2*
I*a + 2*I*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && Eq
Q[(c - I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c-(1+ic)\cot(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{2}(ib)\int \frac{x^2}{-i(-1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{2}(bc)\int \frac{e^{2ia+2ibx}x^2}{-i(-1-ic)+c-ce^{2ia+2ib}}$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) - \frac{1}{2}i\int x$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) + \frac{x\text{Li}_2\left(-\right.}{}$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) + \frac{x\text{Li}_2\left(-\right.}{}$$
$$= \frac{bx^3}{6} + \frac{1}{2}x^2\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{4}ix^2\log\left(1+ice^{2ia+2ibx}\right) + \frac{x\text{Li}_2\left(-\right.}{}$$

Mathematica [A] time = 0.123093, size = 110, normalized size = 0.89

$$\frac{i\left(2ibx\text{PolyLog}\left(2,\frac{ie^{-2i(a+bx)}}{c}\right)+\text{PolyLog}\left(3,\frac{ie^{-2i(a+bx)}}{c}\right)+2b^2x^2\log\left(1-\frac{ie^{-2i(a+bx)}}{c}\right)\right)}{8b^2}+\frac{1}{2}x^2\cot^{-1}(c+(-1-ic)\cot(a+bx)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c - (1 + I*c)*Cot[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (-1 - I*c)*Cot[a + b*x]])/2 + ((I/8)*(2*b^2*x^2*Log[1 - I/(
c*E^((2*I)*(a + b*x)))] + (2*I)*b*x*PolyLog[2, I/(c*E^((2*I)*(a + b*x)))] +
 PolyLog[3, I/(c*E^((2*I)*(a + b*x)))]))/b^2
```

Maple [C] time = 12.221, size = 1492, normalized size = 12.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(Pi-arccot(-c+(1+I*c)*cot(b*x+a))),x)
```

```
[Out] 1/4*I*x^2*ln(1+I*c*exp(2*I*(b*x+a)))+1/4*x*polylog(2,-I*c*exp(2*I*(b*x+a)))
/b+1/4*I*x^2*ln(c-I)+1/8*x^2*Pi*csgn(I*(c-I))*csgn(I/(exp(2*I*(b*x+a))-1))*
```

```
csgn(I*(c-I)/(exp(2*I*(b*x+a))-1))+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn
(I*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+
a))-1))-1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I))*csgn(I/(exp(2*I*(b*x+a))-
1))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))-1/8*x^2*Pi*csgn(I*(
c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^3+1/8*x^2*Pi*csgn((c*exp(2*I*(b
*x+a))-I)/(exp(2*I*(b*x+a))-1))^2-1/8*x^2*Pi*csgn((c*exp(2*I*(b*x+a))-I)/(e
xp(2*I*(b*x+a))-1))^3+1/8*x^2*Pi*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+
a))-1))^2+1/4/b^2*polylog(2,-I*c*exp(2*I*(b*x+a)))*a-1/2/b^2*a*dilog(1+I*ex
p(I*(b*x+a))*(I*c)^(1/2))+1/8*I*polylog(3,-I*c*exp(2*I*(b*x+a)))/b^2+1/8*x^
2*Pi*csgn(I*(c-I)/(exp(2*I*(b*x+a))-1))^3-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)
)*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))
-1))^2-1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(e
xp(2*I*(b*x+a))-1))^2+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*
x+a))-1))^3-1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))*
csgn((c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))+1/6*b*x^3-1/2/b^2*a*dilog
(1-I*exp(I*(b*x+a))*(I*c)^(1/2))+1/8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I))*
csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^2+1/8*x^2*Pi*csgn(I/(ex
p(2*I*(b*x+a))-1))*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^2+1/
8*x^2*Pi*csgn(I*(c*exp(2*I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))*csgn((c*exp(2*
I*(b*x+a))-I)/(exp(2*I*(b*x+a))-1))^2-1/8*x^2*Pi*csgn(I*(c-I))*csgn(I*(c-I)
/(exp(2*I*(b*x+a))-1))^2-1/8*x^2*Pi*csgn(I/(exp(2*I*(b*x+a))-1))*csgn(I*(c-
I)/(exp(2*I*(b*x+a))-1))^2+1/4*I/b^2*ln(1+I*c*exp(2*I*(b*x+a)))*a^2+1/4*I/b
^2*a^2*ln(-c*exp(2*I*(b*x+a))+I)-1/2*I/b^2*a^2*ln(1+I*exp(I*(b*x+a))*(I*c)^
(1/2))+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a)))^3+1/2*I/b*ln(1+I*c*exp(2*I*(b*x+
a)))*x*a-1/2*I/b*a*ln(1+I*exp(I*(b*x+a))*(I*c)^(1/2))*x-1/2*I/b*a*ln(1-I*ex
p(I*(b*x+a))*(I*c)^(1/2))*x+1/8*x^2*Pi*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2
*I*(b*x+a))-1))*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))-1/8*x^2*P
i*csgn(exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b*x+a))-1))^3-1/2*I/b^2*a^2*ln(1-I*
exp(I*(b*x+a))*(I*c)^(1/2))-1/4*I*x^2*ln(c*exp(2*I*(b*x+a))-I)-1/8*x^2*Pi*c
sgn(I*(c-I)/(exp(2*I*(b*x+a))-1))*csgn(I*exp(2*I*(b*x+a))*(c-I)/(exp(2*I*(b
*x+a))-1))^2+1/8*x^2*Pi*csgn(I*exp(I*(b*x+a)))^2*csgn(I*exp(2*I*(b*x+a)))-1
/4*x^2*Pi*csgn(I*exp(I*(b*x+a)))*csgn(I*exp(2*I*(b*x+a)))^2+1/2*I*x^2*ln(ex
p(I*(b*x+a)))
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-arccot(-c+(1+I*c)*cot(b*x+a))),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [C] time = 2.74782, size = 416, normalized size = 3.35

$$\frac{4\,b^3x^3+12\,\pi b^2x^2+6i\,b^2x^2\log\left(\frac{(c-i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right)+4\,a^3+6\,bx\mathrm{Li}_2\left(-i\,ce^{(2i\,bx+2i\,a)}\right)+6i\,a^2\log\left(\frac{ce^{(2i\,bx+2i\,a)}-i}{c}\right)+\left(6i\,b^2x^2-6i\,a\right.}{24\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-arccot(-c+(1+I*c)*cot(b*x+a))),x, algorithm="fricas")
```

```
[Out] 1/24*(4*b^3*x^3 + 12*pi*b^2*x^2 + 6*I*b^2*x^2*log((c - I)*e^(2*I*b*x + 2*I*
a)/(c*e^(2*I*b*x + 2*I*a) - I)) + 4*a^3 + 6*b*x*dilog(-I*c*e^(2*I*b*x + 2*I
*a)) + 6*I*a^2*log((c*e^(2*I*b*x + 2*I*a) - I)/c) + (6*I*b^2*x^2 - 6*I*a^2)
*log(I*c*e^(2*I*b*x + 2*I*a) + 1) + 3*I*polylog(3, -I*c*e^(2*I*b*x + 2*I*a)
))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-acot(-c+(1+I*c)*cot(b*x+a))),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (\pi - \operatorname{arccot}((i\,c+1)\cot(bx+a)-c))x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(pi-arccot(-c+(1+I*c)*cot(b*x+a))),x, algorithm="giac")
```

```
[Out] integrate((pi - arccot((I*c + 1)*cot(b*x + a) - c))*x, x)
```

3.181 $\int \cot^{-1}(c-(1+ic)\cot(a+bx))\,dx$

Optimal. Leaf size=86

$$\frac{\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}+\frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right)+x\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{bx^2}{2}$$

```
[Out] (b*x^2)/2 + x*ArcCot[c - (1 + I*c)*Cot[a + b*x]] + (I/2)*x*Log[1 + I*c*E^((
2*I)*a + (2*I)*b*x)] + PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rubi [A] time = 0.131732, antiderivative size = 86, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {5166, 2184, 2190, 2279, 2391}

$$\frac{\text{PolyLog}\left(2,-ice^{2ia+2ibx}\right)}{4b}+\frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right)+x\cot^{-1}(c-(1+ic)\cot(a+bx))+\frac{bx^2}{2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c - (1 + I*c)*Cot[a + b*x]],x]
```

```
[Out] (b*x^2)/2 + x*ArcCot[c - (1 + I*c)*Cot[a + b*x]] + (I/2)*x*Log[1 + I*c*E^((
2*I)*a + (2*I)*b*x)] + PolyLog[2, (-I)*c*E^((2*I)*a + (2*I)*b*x)]/(4*b)
```

Rule 5166

```
Int[ArcCot[(c_.) + Cot[(a_.) + (b_.)*(x_)]*(d_.)], x_Symbol] :> Simp[x*ArcC
ot[c + d*Cot[a + b*x]], x] + Dist[I*b, Int[x/(c - I*d - c*E^(2*I*a + 2*I*b*
x)), x], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c - I*d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c-(1+ic)\cot(a+bx))\,dx = x\cot^{-1}(c-(1+ic)\cot(a+bx)) + (ib)\int \frac{x}{-i(-1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= \frac{bx^2}{2} + x\cot^{-1}(c-(1+ic)\cot(a+bx)) + (bc)\int \frac{e^{2ia+2ibx}x}{-i(-1-ic)+c-ce^{2ia+2ibx}}\,dx$$
$$= \frac{bx^2}{2} + x\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right) - \frac{1}{2}i\int \log\left(1-\right.$$
$$= \frac{bx^2}{2} + x\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right) - \frac{\text{Subst}\left(\int \frac{\log}{}\right.}{}$$
$$= \frac{bx^2}{2} + x\cot^{-1}(c-(1+ic)\cot(a+bx)) + \frac{1}{2}ix\log\left(1+ice^{2ia+2ibx}\right) + \frac{\text{Li}_2\left(-ice^{2ia+2}\right.}{4b}$$

Mathematica [B] time = 2.61616, size = 872, normalized size = 10.14

$$x\cot^{-1}(c+(-ic-1)\cot(a+bx)) - \frac{ix\csc(a+bx)\left(2bx\log(2\cos(bx)(\cos(bx)-i\,\text{si}\right.}{(\cot(a+bx)+i)((c-i)\cos(a+bx)+i(c+i)\sin(a+bx))\left(\frac{\log\left(\frac{1}{2}\sec(bx)(\cos(a)+i\sin(a))(\right.}{}\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcCot[c - (1 + I*c)*Cot[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (-1 - I*c)*Cot[a + b*x]] - (I*x*Csc[a + b*x]*(2*b*x*Log[2*Cos[
b*x]*(Cos[b*x] - I*Sin[b*x])] + I*Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*((-I +
```

```
c)*Cos[a + b*x] + I*(I + c)*Sin[a + b*x]))/(2*c)]*Log[1 - I*Tan[b*x]] - I*L
og[(Sec[b*x]*(Cos[a] + I*Sin[a])*((1 + I*c)*Cos[a + b*x] - (I + c)*Sin[a +
b*x]))/2]*Log[1 + I*Tan[b*x]] + I*PolyLog[2, -Cos[2*b*x] + I*Sin[2*b*x]] +
I*PolyLog[2, (Sec[b*x]*((I + c)*Cos[a] + (1 + I*c)*Sin[a])*(Cos[a + b*x] -
I*Sin[a + b*x]))/(2*c)] - I*PolyLog[2, ((Cos[a] + I*Sin[a])*((I + c)*Cos[a]
 + (1 + I*c)*Sin[a])*(-I + Tan[b*x]))/2])*(Cos[b*x] - I*Sin[b*x])*(Cos[b*x]
 + I*Sin[b*x]))/((I + Cot[a + b*x])*((-I + c)*Cos[a + b*x] + I*(I + c)*Sin[
a + b*x])*((-2*I)*b*x - Log[1 - (Sec[b*x]*((I + c)*Cos[a] + (1 + I*c)*Sin[a
])*(Cos[a + b*x] - I*Sin[a + b*x]))/(2*c)] - (Log[1 - I*Tan[b*x]]*((I + c)*
Cos[a + b*x] + (1 + I*c)*Sin[a + b*x]))/((-I + c)*Cos[a + b*x] + I*(I + c)*
Sin[a + b*x]) + (Log[1 + I*Tan[b*x]]*((I + c)*Cos[a + b*x] + (1 + I*c)*Sin[
a + b*x]))/((-I + c)*Cos[a + b*x] + I*(I + c)*Sin[a + b*x]) + (Log[(Sec[b*x
]*(Cos[a] + I*Sin[a])*((1 + I*c)*Cos[a + b*x] - (I + c)*Sin[a + b*x]))/2]*S
ec[b*x]^2)/(1 + I*Tan[b*x]) - 2*b*x*Tan[b*x] - I*Log[1 - (Sec[b*x]*((I + c)
*Cos[a] + (1 + I*c)*Sin[a])*(Cos[a + b*x] - I*Sin[a + b*x]))/(2*c)]*Tan[b*x
] + I*Log[1 - I*Tan[b*x]]*Tan[b*x] - I*Log[1 + I*Tan[b*x]]*Tan[b*x] + (I*Lo
g[1 - ((Cos[a] + I*Sin[a])*((I + c)*Cos[a] + (1 + I*c)*Sin[a])*(-I + Tan[b*
x]))/2]*Sec[b*x]^2)/(-I + Tan[b*x]) + (I*Log[(Sec[b*x]*(Cos[a] - I*Sin[a])*
((-I + c)*Cos[a + b*x] + I*(I + c)*Sin[a + b*x]))/(2*c)]*Sec[b*x]^2)/(I + T
an[b*x])))
```

Maple [B] time = 0.116, size = 1756, normalized size = 20.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(Pi-arccot(-c+(1+I*c)*cot(b*x+a)),x)
```

```
[Out] Pi*x+1/4*I/(1+I*c)/b/(I-c)*dilog((c-(1+I*c)*cot(b*x+a)-I)/(-2*I+2*c))+1/4*I
/(1+I*c)/b/(I-c)*ln(-1/2*I*(c-(1+I*c)*cot(b*x+a)+I))*ln((1+I*c)*cot(b*x+a)-
c+I)-1/4*I/(1+I*c)/b/(I-c)*ln(-c-(1+I*c)*cot(b*x+a)+I)*ln(1/2*(c-(1+I*c)*co
t(b*x+a)+I)/c)+1/4*I/(1+I*c)/b/(I-c)*ln(-c-(1+I*c)*cot(b*x+a)+I)*ln((c-(1+I
*c)*cot(b*x+a)-I)/(-2*I+2*c))+1/4*I/(1+I*c)/b/(I-c)*dilog(-1/2*I*((1+I*c)*c
ot(b*x+a)-c+I))*c^2+1/8*I/(1+I*c)/b/(I-c)*ln((1+I*c)*cot(b*x+a)-c+I)^2*c^2+
1/4*I/(1+I*c)/b/(I-c)*dilog(1/2*(c-(1+I*c)*cot(b*x+a)+I)/c)*c^2-1/4*I/(1+I*
c)/b/(I-c)*dilog((c-(1+I*c)*cot(b*x+a)-I)/(-2*I+2*c))*c^2-1/2/(1+I*c)/b/(I-
c)*dilog((c-(1+I*c)*cot(b*x+a)-I)/(-2*I+2*c))*c+1/2/(1+I*c)/b/(I-c)*dilog(-
1/2*I*((1+I*c)*cot(b*x+a)-c+I))*c+1/4/(1+I*c)/b/(I-c)*ln((1+I*c)*cot(b*x+a)
-c+I)^2*c+1/2/(1+I*c)/b/(I-c)*dilog(1/2*(c-(1+I*c)*cot(b*x+a)+I)/c)*c+1/(1+
I*c)/b*arccot(-c+(1+I*c)*cot(b*x+a))/(2*I-2*c)*ln(-c-(1+I*c)*cot(b*x+a)+I)-
1/(1+I*c)/b*arccot(-c+(1+I*c)*cot(b*x+a))/(2*I-2*c)*ln((1+I*c)*cot(b*x+a)-c
```

```
+I)-1/4*I/(1+I*c)/b/(I-c)*dilog(-1/2*I*((1+I*c)*cot(b*x+a)-c+I))-1/8*I/(1+I
*c)/b/(I-c)*ln((1+I*c)*cot(b*x+a)-c+I)^2-1/4*I/(1+I*c)/b/(I-c)*dilog(1/2*(c
-(1+I*c)*cot(b*x+a)+I)/c)+1/4*I/(1+I*c)/b/(I-c)*ln(-c-(1+I*c)*cot(b*x+a)+I)
*ln(1/2*(c-(1+I*c)*cot(b*x+a)+I)/c)*c^2-1/4*I/(1+I*c)/b/(I-c)*ln(-c-(1+I*c)
*cot(b*x+a)+I)*ln((c-(1+I*c)*cot(b*x+a)-I)/(-2*I+2*c))*c^2+2*I/(1+I*c)/b*ar
ccot(-c+(1+I*c)*cot(b*x+a))/(2*I-2*c)*ln(-c-(1+I*c)*cot(b*x+a)+I)*c-2*I/(1+
I*c)/b*arccot(-c+(1+I*c)*cot(b*x+a))/(2*I-2*c)*ln((1+I*c)*cot(b*x+a)-c+I)*c
+1/4*I/(1+I*c)/b/(I-c)*ln(-1/2*I*((1+I*c)*cot(b*x+a)-c+I))*ln(-1/2*I*(c-(1+
I*c)*cot(b*x+a)+I))*c^2-1/4*I/(1+I*c)/b/(I-c)*ln(-1/2*I*(c-(1+I*c)*cot(b*x+
a)+I))*ln((1+I*c)*cot(b*x+a)-c+I)*c^2-1/(1+I*c)/b*arccot(-c+(1+I*c)*cot(b*x
+a))/(2*I-2*c)*ln(-c-(1+I*c)*cot(b*x+a)+I)*c^2+1/(1+I*c)/b*arccot(-c+(1+I*c
)*cot(b*x+a))/(2*I-2*c)*ln((1+I*c)*cot(b*x+a)-c+I)*c^2-1/4*I/(1+I*c)/b/(I-c
)*ln(-1/2*I*((1+I*c)*cot(b*x+a)-c+I))*ln(-1/2*I*(c-(1+I*c)*cot(b*x+a)+I))+1
/2/(1+I*c)/b/(I-c)*ln(-1/2*I*((1+I*c)*cot(b*x+a)-c+I))*ln(-1/2*I*(c-(1+I*c)
*cot(b*x+a)+I))*c-1/2/(1+I*c)/b/(I-c)*ln(-1/2*I*(c-(1+I*c)*cot(b*x+a)+I))*l
n((1+I*c)*cot(b*x+a)-c+I)*c+1/2/(1+I*c)/b/(I-c)*ln(-c-(1+I*c)*cot(b*x+a)+I)
*ln(1/2*(c-(1+I*c)*cot(b*x+a)+I)/c)*c-1/2/(1+I*c)/b/(I-c)*ln(-c-(1+I*c)*cot
(b*x+a)+I)*ln((c-(1+I*c)*cot(b*x+a)-I)/(-2*I+2*c))*c
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-arccot(-c+(1+I*c)*cot(b*x+a)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.36614, size = 323, normalized size = 3.76

$$\frac{2\,b^2x^2 + 4\,\pi bx + 2i\,bx\log\left(\frac{(c-i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right) - 2\,a^2 + (2i\,bx + 2i\,a)\log\left(i\,ce^{(2i\,bx+2i\,a)}+1\right) - 2i\,a\log\left(\frac{ce^{(2i\,bx+2i\,a)}-i}{c}\right) + \mathrm{Li}_2\left(-i\,ce\right.}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-arccot(-c+(1+I*c)*cot(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*b^2*x^2 + 4*pi*b*x + 2*I*b*x*log((c - I)*e^(2*I*b*x + 2*I*a)/(c*e^(2
*I*b*x + 2*I*a) - I)) - 2*a^2 + (2*I*b*x + 2*I*a)*log(I*c*e^(2*I*b*x + 2*I*
```

```
a) + 1) - 2*I*a*log((c*e^(2*I*b*x + 2*I*a) - I)/c) + dilog(-I*c*e^(2*I*b*x
+ 2*I*a)))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-acot(-c+(1+I*c)*cot(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \pi - \operatorname{arccot}\left((i\,c + 1)\cot\left(bx + a\right) - c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(pi-arccot(-c+(1+I*c)*cot(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(pi - arccot((I*c + 1)*cot(b*x + a) - c), x)
```

3.182 $\int \frac{\cot^{-1}(c-(1+ic)\cot(a+bx))}{x}\,dx$

Optimal. Leaf size=24

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c-(1+ic)\cot(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c - (1 + I*c)*Cot[a + b*x]]/x, x]
```

Rubi [A] time = 0.116512, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c-(1+ic)\cot(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c - (1 + I*c)*Cot[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c - (1 + I*c)*Cot[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c-(1+ic)\cot(a+bx))}{x}\,dx = \int \frac{\cot^{-1}(c-(1+ic)\cot(a+bx))}{x}\,dx$$

Mathematica [A] time = 0.379418, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c-(1+ic)\cot(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c - (1 + I*c)*Cot[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c - (1 + I*c)*Cot[a + b*x]]/x, x]
```

Maple [A] time = 0.434, size = 0, normalized size = 0.

$$\int \frac{\pi - \operatorname{arccot}\left(-c + (1 + ic)\cot\left(bx + a\right)\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((Pi-arccot(-c+(1+I*c)*cot(b*x+a)))/x,x)
```

```
[Out] int((Pi-arccot(-c+(1+I*c)*cot(b*x+a)))/x,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-arccot(-c+(1+I*c)*cot(b*x+a)))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{2\,\pi + i\,\log\left(\frac{(c-i)e^{(2i\,bx+2i\,a)}}{ce^{(2i\,bx+2i\,a)}-i}\right)}{2\,x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-arccot(-c+(1+I*c)*cot(b*x+a)))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*pi + I*log((c - I)*e^(2*I*b*x + 2*I*a)/(c*e^(2*I*b*x + 2*I*
a) - I)))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-acot(-c+(1+I*c)*cot(b*x+a)))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\pi - \operatorname{arccot}\left((i\,c+1)\cot\left(bx+a\right)-c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((pi-arccot(-c+(1+I*c)*cot(b*x+a)))/x,x, algorithm="giac")
```

```
[Out] integrate((pi - arccot((I*c + 1)*cot(b*x + a) - c))/x, x)
```

3.183 $\int (e+fx)^3 \cot^{-1}(\tanh(a+bx))\,dx$

Optimal. Leaf size=299

$$-\frac{3if^2(e+fx)\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}+\frac{3if^2(e+fx)\text{PolyLog}\left(4,ie^{2a+2bx}\right)}{8b^3}+\frac{3if(e+fx)^2\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}-\frac{3if(e$$

```
[Out] ((e + f*x)^4*ArcCot[Tanh[a + b*x]])/(4*f) + ((e + f*x)^4*ArcTan[E^(2*a + 2*
b*x)])/(4*f) - ((I/4)*(e + f*x)^3*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b + ((I
/4)*(e + f*x)^3*PolyLog[2, I*E^(2*a + 2*b*x)])/b + (((3*I)/8)*f*(e + f*x)^2
*PolyLog[3, (-I)*E^(2*a + 2*b*x)])/b^2 - (((3*I)/8)*f*(e + f*x)^2*PolyLog[3
, I*E^(2*a + 2*b*x)])/b^2 - (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, (-I)*E^(2*a
 + 2*b*x)])/b^3 + (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, I*E^(2*a + 2*b*x)])/b
^3 + (((3*I)/16)*f^3*PolyLog[5, (-I)*E^(2*a + 2*b*x)])/b^4 - (((3*I)/16)*f^
3*PolyLog[5, I*E^(2*a + 2*b*x)])/b^4
```

Rubi [A] time = 0.208437, antiderivative size = 299, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5184, 4180, 2531, 6609, 2282, 6589}

$$-\frac{3if^2(e+fx)\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}+\frac{3if^2(e+fx)\text{PolyLog}\left(4,ie^{2a+2bx}\right)}{8b^3}+\frac{3if(e+fx)^2\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}-\frac{3if(e$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^3*ArcCot[Tanh[a + b*x]],x]
```


```
[Out] ((e + f*x)^4*ArcCot[Tanh[a + b*x]])/(4*f) + ((e + f*x)^4*ArcTan[E^(2*a + 2*
b*x)])/(4*f) - ((I/4)*(e + f*x)^3*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b + ((I
/4)*(e + f*x)^3*PolyLog[2, I*E^(2*a + 2*b*x)])/b + (((3*I)/8)*f*(e + f*x)^2
*PolyLog[3, (-I)*E^(2*a + 2*b*x)])/b^2 - (((3*I)/8)*f*(e + f*x)^2*PolyLog[3
, I*E^(2*a + 2*b*x)])/b^2 - (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, (-I)*E^(2*a
 + 2*b*x)])/b^3 + (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, I*E^(2*a + 2*b*x)])/b
^3 + (((3*I)/16)*f^3*PolyLog[5, (-I)*E^(2*a + 2*b*x)])/b^4 - (((3*I)/16)*f^
3*PolyLog[5, I*E^(2*a + 2*b*x)])/b^4
```


Rule 5184

```
Int[ArcCot[Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.), x_Symbol]
:> Simp[((e + f*x)^(m + 1)*ArcCot[Tanh[a + b*x]])/(f*(m + 1)), x] + Dist[b/
(f*(m + 1)), Int[(e + f*x)^(m + 1)*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b
```

```
, e, f}, x] && IGtQ[m, 0]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int (e+fx)^3\cot^{-1}(\tanh(a+bx))\,dx = \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{b\int (e+fx)^4\mathbf{sech}(2a+2bx)\,dx}{4f}$$
$$= \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f}-\frac{1}{2}i\int (e+fx)^3\log\left(1\right.$$
$$= \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f}-\frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a+2}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f}-\frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a+2}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f}-\frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a+2}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f}-\frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a+2}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\tanh(a+bx))}{4f}+\frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f}-\frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a+2}\right.}{4b}$$

Mathematica [B] time = 0.332775, size = 600, normalized size = 2.01

$$\frac{1}{4}x\left(6e^2fx+4e^3+4ef^2x^2+f^3x^3\right)\cot^{-1}(\tanh(a+bx))+\frac{i\left(6b^2e^2f\mathrm{PolyLog}\left(3,-ie^{2(a+bx)}\right)-6b^2e^2f\mathrm{PolyLog}\left(3,ie^{2(a+bx)}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^3*ArcCot[Tanh[a + b*x]],x]
```

```
[Out] (x*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3)*ArcCot[Tanh[a + b*x]])/4 + (
(I/16)*(8*b^4*e^3*x*Log[1 - I*E^(2*(a + b*x))] + 12*b^4*e^2*f*x^2*Log[1 - I
*E^(2*(a + b*x))] + 8*b^4*e*f^2*x^3*Log[1 - I*E^(2*(a + b*x))] + 2*b^4*f^3*
x^4*Log[1 - I*E^(2*(a + b*x))] - 8*b^4*e^3*x*Log[1 + I*E^(2*(a + b*x))] - 1
2*b^4*e^2*f*x^2*Log[1 + I*E^(2*(a + b*x))] - 8*b^4*e*f^2*x^3*Log[1 + I*E^(2
*(a + b*x))] - 2*b^4*f^3*x^4*Log[1 + I*E^(2*(a + b*x))] - 4*b^3*(e + f*x)^3
*PolyLog[2, (-I)*E^(2*(a + b*x))] + 4*b^3*(e + f*x)^3*PolyLog[2, I*E^(2*(a
+ b*x))] + 6*b^2*e^2*f*PolyLog[3, (-I)*E^(2*(a + b*x))] + 12*b^2*e*f^2*x*Po
lyLog[3, (-I)*E^(2*(a + b*x))] + 6*b^2*f^3*x^2*PolyLog[3, (-I)*E^(2*(a + b*
x))] - 6*b^2*e^2*f*PolyLog[3, I*E^(2*(a + b*x))] - 12*b^2*e*f^2*x*PolyLog[3
, I*E^(2*(a + b*x))] - 6*b^2*f^3*x^2*PolyLog[3, I*E^(2*(a + b*x))] - 6*b*e*
f^2*PolyLog[4, (-I)*E^(2*(a + b*x))] - 6*b*f^3*x*PolyLog[4, (-I)*E^(2*(a +
b*x))] + 6*b*e*f^2*PolyLog[4, I*E^(2*(a + b*x))] + 6*b*f^3*x*PolyLog[4, I*E
^(2*(a + b*x))] + 3*f^3*PolyLog[5, (-I)*E^(2*(a + b*x))] - 3*f^3*PolyLog[5,
```

```
I*E^(2*(a + b*x))]))/b^4
```

Maple [C] time = 4.991, size = 7275, normalized size = 24.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^3*arccot(tanh(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\left(f^3x^4 + 4\,ef^2x^3 + 6\,e^2fx^2 + 4\,e^3x\right)\arctan\left(e^{(2\,bx+2\,a)} + 1, e^{(2\,bx+2\,a)} - 1\right) + \int \frac{\left(bf^3x^4e^{(2\,a)} + 4\,bef^2x^3e^{(2\,a)} + 6\,be^2fx^2e^{(2}}{2\left(e^{(4\,bx+4\,a)} + 1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*arccot(tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/4*(f^3*x^4 + 4*e*f^2*x^3 + 6*e^2*f*x^2 + 4*e^3*x)*arctan2(e^(2*b*x + 2*a)
 + 1, e^(2*b*x + 2*a) - 1) + integrate(1/2*(b*f^3*x^4*e^(2*a) + 4*b*e*f^2*x
^3*e^(2*a) + 6*b*e^2*f*x^2*e^(2*a) + 4*b*e^3*x*e^(2*a))*e^(2*b*x)/(e^(4*b*x
 + 4*a) + 1), x)
```

Fricas [C] time = 3.88441, size = 4072, normalized size = 13.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*arccot(tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/8*(-24*I*f^3*polylog(5, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) -
24*I*f^3*polylog(5, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 24*I*
```

```
f^3*polylog(5, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 24*I*f^3*p
olylog(5, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*(b^4*f^3*x^4
 + 4*b^4*e*f^2*x^3 + 6*b^4*e^2*f*x^2 + 4*b^4*e^3*x)*arctan(cosh(b*x + a)/si
nh(b*x + a)) + (4*I*b^3*f^3*x^3 + 12*I*b^3*e*f^2*x^2 + 12*I*b^3*e^2*f*x + 4
*I*b^3*e^3)*dilog(1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (4*I*b^3
*f^3*x^3 + 12*I*b^3*e*f^2*x^2 + 12*I*b^3*e^2*f*x + 4*I*b^3*e^3)*dilog(-1/2*
sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-4*I*b^3*f^3*x^3 - 12*I*b^3*e
*f^2*x^2 - 12*I*b^3*e^2*f*x - 4*I*b^3*e^3)*dilog(1/2*sqrt(-4*I)*(cosh(b*x +
 a) + sinh(b*x + a))) + (-4*I*b^3*f^3*x^3 - 12*I*b^3*e*f^2*x^2 - 12*I*b^3*e
^2*f*x - 4*I*b^3*e^3)*dilog(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))
) + (I*b^4*f^3*x^4 + 4*I*b^4*e*f^2*x^3 + 6*I*b^4*e^2*f*x^2 + 4*I*b^4*e^3*x
+ 4*I*a*b^3*e^3 - 6*I*a^2*b^2*e^2*f + 4*I*a^3*b*e*f^2 - I*a^4*f^3)*log(1/2*
sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^4*f^3*x^4 + 4*I*b^4*e
*f^2*x^3 + 6*I*b^4*e^2*f*x^2 + 4*I*b^4*e^3*x + 4*I*a*b^3*e^3 - 6*I*a^2*b^2*
e^2*f + 4*I*a^3*b*e*f^2 - I*a^4*f^3)*log(-1/2*sqrt(4*I)*(cosh(b*x + a) + si
nh(b*x + a)) + 1) + (-I*b^4*f^3*x^4 - 4*I*b^4*e*f^2*x^3 - 6*I*b^4*e^2*f*x^2
 - 4*I*b^4*e^3*x - 4*I*a*b^3*e^3 + 6*I*a^2*b^2*e^2*f - 4*I*a^3*b*e*f^2 + I*
a^4*f^3)*log(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^4*
f^3*x^4 - 4*I*b^4*e*f^2*x^3 - 6*I*b^4*e^2*f*x^2 - 4*I*b^4*e^3*x - 4*I*a*b^3
*e^3 + 6*I*a^2*b^2*e^2*f - 4*I*a^3*b*e*f^2 + I*a^4*f^3)*log(-1/2*sqrt(-4*I)
*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-4*I*a*b^3*e^3 + 6*I*a^2*b^2*e^2*f
 - 4*I*a^3*b*e*f^2 + I*a^4*f^3)*log(I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(
b*x + a)) + (-4*I*a*b^3*e^3 + 6*I*a^2*b^2*e^2*f - 4*I*a^3*b*e*f^2 + I*a^4*f
^3)*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (4*I*a*b^3*e^3
- 6*I*a^2*b^2*e^2*f + 4*I*a^3*b*e*f^2 - I*a^4*f^3)*log(I*sqrt(-4*I) + 2*cos
h(b*x + a) + 2*sinh(b*x + a)) + (4*I*a*b^3*e^3 - 6*I*a^2*b^2*e^2*f + 4*I*a^
3*b*e*f^2 - I*a^4*f^3)*log(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a
)) + (24*I*b*f^3*x + 24*I*b*e*f^2)*polylog(4, 1/2*sqrt(4*I)*(cosh(b*x + a)
+ sinh(b*x + a))) + (24*I*b*f^3*x + 24*I*b*e*f^2)*polylog(4, -1/2*sqrt(4*I)
*(cosh(b*x + a) + sinh(b*x + a))) + (-24*I*b*f^3*x - 24*I*b*e*f^2)*polylog(
4, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-24*I*b*f^3*x - 24*I*
b*e*f^2)*polylog(4, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-12
*I*b^2*f^3*x^2 - 24*I*b^2*e*f^2*x - 12*I*b^2*e^2*f)*polylog(3, 1/2*sqrt(4*I
)*(cosh(b*x + a) + sinh(b*x + a))) + (-12*I*b^2*f^3*x^2 - 24*I*b^2*e*f^2*x
- 12*I*b^2*e^2*f)*polylog(3, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))
) + (12*I*b^2*f^3*x^2 + 24*I*b^2*e*f^2*x + 12*I*b^2*e^2*f)*polylog(3, 1/2*s
qrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (12*I*b^2*f^3*x^2 + 24*I*b^2*e
*f^2*x + 12*I*b^2*e^2*f)*polylog(3, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b
*x + a))))/b^4
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(e+fx\right)^{3}\operatorname{acot}\left(\tanh\left(a+bx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**3*acot(tanh(b*x+a)),x)
```

```
[Out] Integral((e + f*x)**3*acot(tanh(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx+e\right)^{3}\operatorname{arccot}\left(\tanh\left(bx+a\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*arccot(tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^3*arccot(tanh(b*x + a)), x)
```

3.184 $\int (e+fx)^2 \cot^{-1}(\tanh(a+bx))\,dx$

Optimal. Leaf size=229

$$\frac{if(e+fx)\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{4b^2}-\frac{if(e+fx)\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{4b^2}-\frac{if^2\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}+\frac{if^2\text{PolyLog}\left(4,ie^{2a-}\right.}{8b^3}$$

```
[Out] ((e + f*x)^3*ArcCot[Tanh[a + b*x]])/(3*f) + ((e + f*x)^3*ArcTan[E^(2*a + 2*
b*x)])/(3*f) - ((I/4)*(e + f*x)^2*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b + ((I
/4)*(e + f*x)^2*PolyLog[2, I*E^(2*a + 2*b*x)])/b + ((I/4)*f*(e + f*x)*PolyL
og[3, (-I)*E^(2*a + 2*b*x)])/b^2 - ((I/4)*f*(e + f*x)*PolyLog[3, I*E^(2*a +
 2*b*x)])/b^2 - ((I/8)*f^2*PolyLog[4, (-I)*E^(2*a + 2*b*x)])/b^3 + ((I/8)*f
^2*PolyLog[4, I*E^(2*a + 2*b*x)])/b^3
```

Rubi [A] time = 0.153882, antiderivative size = 229, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5184, 4180, 2531, 6609, 2282, 6589}

$$\frac{if(e+fx)\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{4b^2}-\frac{if(e+fx)\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{4b^2}-\frac{if^2\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}+\frac{if^2\text{PolyLog}\left(4,ie^{2a-}\right.}{8b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^2*ArcCot[Tanh[a + b*x]],x]
```

```
[Out] ((e + f*x)^3*ArcCot[Tanh[a + b*x]])/(3*f) + ((e + f*x)^3*ArcTan[E^(2*a + 2*
b*x)])/(3*f) - ((I/4)*(e + f*x)^2*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b + ((I
/4)*(e + f*x)^2*PolyLog[2, I*E^(2*a + 2*b*x)])/b + ((I/4)*f*(e + f*x)*PolyL
og[3, (-I)*E^(2*a + 2*b*x)])/b^2 - ((I/4)*f*(e + f*x)*PolyLog[3, I*E^(2*a +
 2*b*x)])/b^2 - ((I/8)*f^2*PolyLog[4, (-I)*E^(2*a + 2*b*x)])/b^3 + ((I/8)*f
^2*PolyLog[4, I*E^(2*a + 2*b*x)])/b^3
```

Rule 5184

```
Int[ArcCot[Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.), x_Symbol]
:> Simp[((e + f*x)^(m + 1)*ArcCot[Tanh[a + b*x]])/(f*(m + 1)), x] + Dist[b/
(f*(m + 1)), Int[(e + f*x)^(m + 1)*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b
, e, f}, x] && IGtQ[m, 0]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int (e+fx)^2\cot^{-1}(\tanh(a+bx))\,dx = \frac{(e+fx)^3\cot^{-1}(\tanh(a+bx))}{3f}+\frac{b\int (e+fx)^3\mathrm{sech}(2a+2bx)\,dx}{3f}$$

$$= \frac{(e+fx)^3\cot^{-1}(\tanh(a+bx))}{3f}+\frac{(e+fx)^3\tan^{-1}\left(e^{2a+2bx}\right)}{3f}-\frac{1}{2}i\int (e+fx)^2\log\left(1\right.$$

$$= \frac{(e+fx)^3\cot^{-1}(\tanh(a+bx))}{3f}+\frac{(e+fx)^3\tan^{-1}\left(e^{2a+2bx}\right)}{3f}-\frac{i(e+fx)^2\mathrm{Li}_2\left(-ie^{2a+2}\right.}{4b}$$

$$= \frac{(e+fx)^3\cot^{-1}(\tanh(a+bx))}{3f}+\frac{(e+fx)^3\tan^{-1}\left(e^{2a+2bx}\right)}{3f}-\frac{i(e+fx)^2\mathrm{Li}_2\left(-ie^{2a+2}\right.}{4b}$$

$$= \frac{(e+fx)^3\cot^{-1}(\tanh(a+bx))}{3f}+\frac{(e+fx)^3\tan^{-1}\left(e^{2a+2bx}\right)}{3f}-\frac{i(e+fx)^2\mathrm{Li}_2\left(-ie^{2a+2}\right.}{4b}$$

$$= \frac{(e+fx)^3\cot^{-1}(\tanh(a+bx))}{3f}+\frac{(e+fx)^3\tan^{-1}\left(e^{2a+2bx}\right)}{3f}-\frac{i(e+fx)^2\mathrm{Li}_2\left(-ie^{2a+2}\right.}{4b}$$

Mathematica [A] time = 0.189336, size = 375, normalized size = 1.64

$$\frac{1}{3}x\left(3e^2+3efx+f^2x^2\right)\cot^{-1}(\tanh(a+bx))+\frac{i\left(-6b^2(e+fx)^2\mathrm{PolyLog}\left(2,-ie^{2(a+bx)}\right)+6b^2(e+fx)^2\mathrm{PolyLog}\left(2,ie^{2(a+\right.\right.}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^2*ArcCot[Tanh[a + b*x]],x]
```

```
[Out] (x*(3*e^2 + 3*e*f*x + f^2*x^2)*ArcCot[Tanh[a + b*x]])/3 + ((I/24)*(12*b^3*e
^2*x*Log[1 - I*E^(2*(a + b*x))] + 12*b^3*e*f*x^2*Log[1 - I*E^(2*(a + b*x))]
 + 4*b^3*f^2*x^3*Log[1 - I*E^(2*(a + b*x))] - 12*b^3*e^2*x*Log[1 + I*E^(2*(
a + b*x))] - 12*b^3*e*f*x^2*Log[1 + I*E^(2*(a + b*x))] - 4*b^3*f^2*x^3*Log[
1 + I*E^(2*(a + b*x))] - 6*b^2*(e + f*x)^2*PolyLog[2, (-I)*E^(2*(a + b*x))]
 + 6*b^2*(e + f*x)^2*PolyLog[2, I*E^(2*(a + b*x))] + 6*b*e*f*PolyLog[3, (-I
)*E^(2*(a + b*x))] + 6*b*f^2*x*PolyLog[3, (-I)*E^(2*(a + b*x))] - 6*b*e*f*P
olyLog[3, I*E^(2*(a + b*x))] - 6*b*f^2*x*PolyLog[3, I*E^(2*(a + b*x))] - 3*
f^2*PolyLog[4, (-I)*E^(2*(a + b*x))] + 3*f^2*PolyLog[4, I*E^(2*(a + b*x))])
)/b^3
```

Maple [C] time = 10.434, size = 5425, normalized size = 23.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^2*arccot(tanh(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\left(f^{2}x^{3}+3\,efx^{2}+3\,e^{2}x\right)\arctan\left(e^{(2\,bx+2\,a)}+1,e^{(2\,bx+2\,a)}-1\right)+\int\frac{2\left(bf^{2}x^{3}e^{(2\,a)}+3\,befx^{2}e^{(2\,a)}+3\,be^{2}xe^{(2\,a)}\right)e^{(2\,bx)}}{3\left(e^{(4\,bx+4\,a)}+1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*arccot(tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*(f^2*x^3 + 3*e*f*x^2 + 3*e^2*x)*arctan2(e^(2*b*x + 2*a) + 1, e^(2*b*x +
 2*a) - 1) + integrate(2/3*(b*f^2*x^3*e^(2*a) + 3*b*e*f*x^2*e^(2*a) + 3*b*e
^2*x*e^(2*a))*e^(2*b*x)/(e^(4*b*x + 4*a) + 1), x)
```

Fricas [C] time = 3.56103, size = 2901, normalized size = 12.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*arccot(tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/6*(6*I*f^2*polylog(4, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 6*
I*f^2*polylog(4, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 6*I*f^2*
polylog(4, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 6*I*f^2*polylo
g(4, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*(b^3*f^2*x^3 + 3*
b^3*e*f*x^2 + 3*b^3*e^2*x)*arctan(cosh(b*x + a)/sinh(b*x + a)) + (3*I*b^2*f
^2*x^2 + 6*I*b^2*e*f*x + 3*I*b^2*e^2)*dilog(1/2*sqrt(4*I)*(cosh(b*x + a) +
sinh(b*x + a))) + (3*I*b^2*f^2*x^2 + 6*I*b^2*e*f*x + 3*I*b^2*e^2)*dilog(-1/
2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-3*I*b^2*f^2*x^2 - 6*I*b^2*
e*f*x - 3*I*b^2*e^2)*dilog(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)))
+ (-3*I*b^2*f^2*x^2 - 6*I*b^2*e*f*x - 3*I*b^2*e^2)*dilog(-1/2*sqrt(-4*I)*(c
osh(b*x + a) + sinh(b*x + a))) + (I*b^3*f^2*x^3 + 3*I*b^3*e*f*x^2 + 3*I*b^3
*e^2*x + 3*I*a*b^2*e^2 - 3*I*a^2*b*e*f + I*a^3*f^2)*log(1/2*sqrt(4*I)*(cosh
```

```
(b*x + a) + sinh(b*x + a)) + 1) + (I*b^3*f^2*x^3 + 3*I*b^3*e*f*x^2 + 3*I*b^
3*e^2*x + 3*I*a*b^2*e^2 - 3*I*a^2*b*e*f + I*a^3*f^2)*log(-1/2*sqrt(4*I)*(co
sh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^3*f^2*x^3 - 3*I*b^3*e*f*x^2 - 3*I
*b^3*e^2*x - 3*I*a*b^2*e^2 + 3*I*a^2*b*e*f - I*a^3*f^2)*log(1/2*sqrt(-4*I)*
(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^3*f^2*x^3 - 3*I*b^3*e*f*x^2 -
3*I*b^3*e^2*x - 3*I*a*b^2*e^2 + 3*I*a^2*b*e*f - I*a^3*f^2)*log(-1/2*sqrt(-4
*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-3*I*a*b^2*e^2 + 3*I*a^2*b*e*f
- I*a^3*f^2)*log(I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (-3*I*a
*b^2*e^2 + 3*I*a^2*b*e*f - I*a^3*f^2)*log(-I*sqrt(4*I) + 2*cosh(b*x + a) +
2*sinh(b*x + a)) + (3*I*a*b^2*e^2 - 3*I*a^2*b*e*f + I*a^3*f^2)*log(I*sqrt(-
4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (3*I*a*b^2*e^2 - 3*I*a^2*b*e*f
+ I*a^3*f^2)*log(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (-6*I
*b*f^2*x - 6*I*b*e*f)*polylog(3, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x +
a))) + (-6*I*b*f^2*x - 6*I*b*e*f)*polylog(3, -1/2*sqrt(4*I)*(cosh(b*x + a)
+ sinh(b*x + a))) + (6*I*b*f^2*x + 6*I*b*e*f)*polylog(3, 1/2*sqrt(-4*I)*(co
sh(b*x + a) + sinh(b*x + a))) + (6*I*b*f^2*x + 6*I*b*e*f)*polylog(3, -1/2*s
qrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))))/b^3
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(e + fx\right)^2 \operatorname{acot}\left(\tanh\left(a + bx\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*acot(tanh(b*x+a)),x)
```

```
[Out] Integral((e + f*x)**2*acot(tanh(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx + e\right)^2 \operatorname{arccot}\left(\tanh\left(bx + a\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*arccot(tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^2*arccot(tanh(b*x + a)), x)
```

3.185 $\int (e+fx)\cot^{-1}(\tanh(a+bx))\,dx$

Optimal. Leaf size=159

$$\frac{if\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}-\frac{if\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{8b^2}-\frac{i(e+fx)\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}+\frac{i(e+fx)\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}$$

```
[Out] ((e + f*x)^2*ArcCot[Tanh[a + b*x]])/(2*f) + ((e + f*x)^2*ArcTan[E^(2*a + 2*
b*x)])/(2*f) - ((I/4)*(e + f*x)*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b + ((I/4
)*(e + f*x)*PolyLog[2, I*E^(2*a + 2*b*x)])/b + ((I/8)*f*PolyLog[3, (-I)*E^(
2*a + 2*b*x)])/b^2 - ((I/8)*f*PolyLog[3, I*E^(2*a + 2*b*x)])/b^2
```

Rubi [A] time = 0.101938, antiderivative size = 159, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {5184, 4180, 2531, 2282, 6589}

$$\frac{if\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}-\frac{if\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{8b^2}-\frac{i(e+fx)\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}+\frac{i(e+fx)\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)*ArcCot[Tanh[a + b*x]],x]
```

```
[Out] ((e + f*x)^2*ArcCot[Tanh[a + b*x]])/(2*f) + ((e + f*x)^2*ArcTan[E^(2*a + 2*
b*x)])/(2*f) - ((I/4)*(e + f*x)*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b + ((I/4
)*(e + f*x)*PolyLog[2, I*E^(2*a + 2*b*x)])/b + ((I/8)*f*PolyLog[3, (-I)*E^(
2*a + 2*b*x)])/b^2 - ((I/8)*f*PolyLog[3, I*E^(2*a + 2*b*x)])/b^2
```

Rule 5184

```
Int[ArcCot[Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.), x_Symbol]
:> Simp[((e + f*x)^(m + 1)*ArcCot[Tanh[a + b*x]])/(f*(m + 1)), x] + Dist[b/
(f*(m + 1)), Int[(e + f*x)^(m + 1)*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b
, e, f}, x] && IGtQ[m, 0]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
```

```
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int (e+fx)\cot^{-1}(\tanh(a+bx))\,dx = \frac{(e+fx)^2\cot^{-1}(\tanh(a+bx))}{2f} + \frac{b\int (e+fx)^2\mathbf{sech}(2a+2bx)\,dx}{2f}$$

$$= \frac{(e+fx)^2\cot^{-1}(\tanh(a+bx))}{2f} + \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} - \frac{1}{2}i\int (e+fx)\log\left(1-\right.$$

$$= \frac{(e+fx)^2\cot^{-1}(\tanh(a+bx))}{2f} + \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} - \frac{i(e+fx)\mathbf{Li}_2\left(-ie^{2a+2bx}\right.}{4b}$$

$$= \frac{(e+fx)^2\cot^{-1}(\tanh(a+bx))}{2f} + \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} - \frac{i(e+fx)\mathbf{Li}_2\left(-ie^{2a+2bx}\right.}{4b}$$

$$= \frac{(e+fx)^2\cot^{-1}(\tanh(a+bx))}{2f} + \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} - \frac{i(e+fx)\mathbf{Li}_2\left(-ie^{2a+2bx}\right.}{4b}$$

Mathematica [A] time = 0.222783, size = 278, normalized size = 1.75

$$\frac{if\left(-2bx\text{PolyLog}\left(2,-ie^{2(a+bx)}\right)+2bx\text{PolyLog}\left(2,ie^{2(a+bx)}\right)+\text{PolyLog}\left(3,-ie^{2(a+bx)}\right)-\text{PolyLog}\left(3,ie^{2(a+bx)}\right)+2b^2x^2}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)*ArcCot[Tanh[a + b*x]],x]
```

```
[Out] e*x*ArcCot[Tanh[a + b*x]] + (f*x^2*ArcCot[Tanh[a + b*x]])/2 + (e*(-(((-4*I)
*a + Pi - (4*I)*b*x)*(Log[1 - I*E^(2*(a + b*x))] - Log[1 + I*E^(2*(a + b*x)
)])) + ((-4*I)*a + Pi)*Log[Cot[((4*I)*a + Pi + (4*I)*b*x)/4]] - (2*I)*(Poly
Log[2, (-I)*E^(2*(a + b*x))] - PolyLog[2, I*E^(2*(a + b*x))])))/(8*b) + ((I
/8)*f*(2*b^2*x^2*Log[1 - I*E^(2*(a + b*x))] - 2*b^2*x^2*Log[1 + I*E^(2*(a +
 b*x))] - 2*b*x*PolyLog[2, (-I)*E^(2*(a + b*x))] + 2*b*x*PolyLog[2, I*E^(2*
(a + b*x))] + PolyLog[3, (-I)*E^(2*(a + b*x))] - PolyLog[3, I*E^(2*(a + b*x
))]))/b^2
```

Maple [C] time = 8.715, size = 2688, normalized size = 16.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*arccot(tanh(b*x+a)),x)
```

```
[Out] 1/2*I/b*e*dilog(((-I)^(1/2)-exp(b*x+a))/(-I)^(1/2))+1/2*I/b*e*dilog(((-I)^(
1/2)+exp(b*x+a))/(-I)^(1/2))-1/2*I*e/b*dilog(1+exp(b*x+a)*(-1)^(3/4))-1/2*I
*e/b*dilog(1-exp(b*x+a)*(-1)^(3/4))+1/8*Pi*x^2*f*csgn((1-I)*(exp(2*b*x+2*a)
-I)/(exp(2*b*x+2*a)+1))^2+1/4*Pi*x*e*csgn((1-I)*(exp(2*b*x+2*a)-I)/(exp(2*b
*x+2*a)+1))^2-1/4*Pi*x*e*csgn((1+I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))^
3+1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))^3-1/8*Pi*x^2*f
*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))*csgn((1+I)*(exp(2*b*x+2*a)+I
)/(exp(2*b*x+2*a)+1))+1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+
1))*csgn((1-I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))-1/4*Pi*x*e*csgn(I*(ex
p(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))*csgn((1+I)*(exp(2*b*x+2*a)+I)/(exp(2*b*
x+2*a)+1))+1/4*I*ln(exp(2*b*x+2*a)-I)*f*x^2-1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+
2*a)+I)/(exp(2*b*x+2*a)+1))^3-1/8*Pi*x^2*f*csgn((1-I)*(exp(2*b*x+2*a)-I)/(e
xp(2*b*x+2*a)+1))^3-1/8*Pi*x^2*f*csgn((1+I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2
*a)+1))^3+1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))^3-1/4*I*
f/b^2*a^2*ln(-exp(2*b*x+2*a)+I)+1/2*I*e/b*a*ln(-exp(2*b*x+2*a)+I)-1/2*I/b*a
```

```
*e*ln(exp(2*b*x+2*a)+I)-1/4*I*f*ln(1+I*exp(2*b*x+2*a))*x^2-1/2*I*e*ln(1+exp
(b*x+a)*(-1)^(3/4))*x-1/2*I*e*ln(1-exp(b*x+a)*(-1)^(3/4))*x+1/4*Pi*x*e*csgn
(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))*csgn((1+I)*(exp(2*b*x+2*a)+I)/(ex
p(2*b*x+2*a)+1))^2+1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1
))*csgn((1+I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))^2+1/4*I/b^2*f*a^2*ln(e
xp(2*b*x+2*a)+I)+1/4*Pi*x*e*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*
a)+I)/(exp(2*b*x+2*a)+1))^2-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I*(e
xp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))^2+1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)+I)
)*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))^2+1/4*I*f*ln(1-I*exp(2*b*x+
2*a))*x^2+1/2*I*ln(((-I)^(1/2)+exp(b*x+a))/(-I)^(1/2))*x*e+1/2*I*ln(((-I)^(
1/2)-exp(b*x+a))/(-I)^(1/2))*x*e+1/8*I*f*polylog(3,-I*exp(2*b*x+2*a))/b^2-1
/8*Pi*x^2*f*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x
+2*a)+1))^2-1/2*I*(1/2*f*x^2+e*x)*ln(exp(2*b*x+2*a)+I)+1/8*Pi*x^2*f*csgn(I*
(exp(2*b*x+2*a)+I))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))^2-1/8*Pi*
x^2*f*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))*csgn((1-I)*(exp(2*b*x+2
*a)-I)/(exp(2*b*x+2*a)+1))^2-1/4*Pi*x*e*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(
exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))^2+1/8*Pi*f*x^2+1/4*Pi*e*x+1/2*I*ln(ex
p(2*b*x+2*a)-I)*e*x-1/4*I*f/b^2*ln(1+I*exp(2*b*x+2*a))*a^2-1/4*I*f/b*polylo
g(2,-I*exp(2*b*x+2*a))*x-1/4*I*f/b^2*polylog(2,-I*exp(2*b*x+2*a))*a+1/2*I/b
*ln(((-I)^(1/2)+exp(b*x+a))/(-I)^(1/2))*a*e+1/2*I/b*ln(((-I)^(1/2)-exp(b*x+
a))/(-I)^(1/2))*a*e-1/2*I/b^2*f*a^2*ln(((-I)^(1/2)+exp(b*x+a))/(-I)^(1/2))+
1/4*I/b*f*polylog(2,I*exp(2*b*x+2*a))*x+1/4*I/b^2*f*polylog(2,I*exp(2*b*x+2
*a))*a+1/4*I/b^2*f*ln(1-I*exp(2*b*x+2*a))*a^2-1/2*I/b^2*f*a^2*ln(((-I)^(1/2
)-exp(b*x+a))/(-I)^(1/2))+1/8*Pi*x^2*f*csgn((1+I)*(exp(2*b*x+2*a)+I)/(exp(2
*b*x+2*a)+1))^2+1/4*Pi*x*e*csgn((1+I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1)
)^2-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))*csgn((1-I)*(ex
p(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))^2+1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*a)-I
)/(exp(2*b*x+2*a)+1))*csgn((1-I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))+1/8
*Pi*x^2*f*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2
*a)+1))^2-1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I*(exp(2*b*x+2*a)-I)
/(exp(2*b*x+2*a)+1))^2-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)
+1))^3-1/4*Pi*x*e*csgn((1-I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)+1))^3-1/8*I
*f*polylog(3,I*exp(2*b*x+2*a))/b^2-1/2*I/b*f*a*ln(((-I)^(1/2)+exp(b*x+a))/(
-I)^(1/2))*x+1/2*I/b*f*ln(1-I*exp(2*b*x+2*a))*x*a-1/2*I/b*f*a*ln(((-I)^(1/2
)-exp(b*x+a))/(-I)^(1/2))*x-1/2*I*f/b*ln(1+I*exp(2*b*x+2*a))*x*a+1/2*I*f/b*
a*ln(1+exp(b*x+a)*(-1)^(3/4))*x+1/2*I*f/b*a*ln(1-exp(b*x+a)*(-1)^(3/4))*x+1
/2*I*f/b^2*a*dilog(1+exp(b*x+a)*(-1)^(3/4))+1/2*I*f/b^2*a*dilog(1-exp(b*x+a
)*(-1)^(3/4))-1/2*I/b^2*f*a*dilog(((-I)^(1/2)-exp(b*x+a))/(-I)^(1/2))-1/2*I
/b^2*f*a*dilog(((-I)^(1/2)+exp(b*x+a))/(-I)^(1/2))+1/8*Pi*x^2*f*csgn(I/(exp
(2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2
*b*x+2*a)+1))-1/8*Pi*x^2*f*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*a
)+I))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))+1/4*Pi*x*e*csgn(I/(exp(
2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*
b*x+2*a)+1))-1/4*Pi*x*e*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(exp(2*b*x+2*a)+I
))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)+1))-1/2*I*e/b*ln(1+exp(b*x+a)*
```

```
(-1)^(3/4))*a-1/2*I*e/b*ln(1-exp(b*x+a)*(-1)^(3/4))*a+1/2*I*f/b^2*a^2*ln(1+
exp(b*x+a)*(-1)^(3/4))+1/2*I*f/b^2*a^2*ln(1-exp(b*x+a)*(-1)^(3/4))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\left(fx^2+2\,ex\right)\arctan\left(e^{(2\,bx+2\,a)}+1,e^{(2\,bx+2\,a)}-1\right)+\int\frac{\left(bfx^2e^{(2\,a)}+2\,bexe^{(2\,a)}\right)e^{(2\,bx)}}{e^{(4\,bx+4\,a)}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*arccot(tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*(f*x^2 + 2*e*x)*arctan2(e^(2*b*x + 2*a) + 1, e^(2*b*x + 2*a) - 1) + int
egrate((b*f*x^2*e^(2*a) + 2*b*e*x*e^(2*a))*e^(2*b*x)/(e^(4*b*x + 4*a) + 1),
 x)
```

Fricas [C] time = 3.34042, size = 1894, normalized size = 11.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*arccot(tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b^2*f*x^2 + 2*b^2*e*x)*arctan(cosh(b*x + a)/sinh(b*x + a)) + (2*I*b
*f*x + 2*I*b*e)*dilog(1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (2*I
*b*f*x + 2*I*b*e)*dilog(-1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (
-2*I*b*f*x - 2*I*b*e)*dilog(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)))
 + (-2*I*b*f*x - 2*I*b*e)*dilog(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x +
 a))) + (I*b^2*f*x^2 + 2*I*b^2*e*x + 2*I*a*b*e - I*a^2*f)*log(1/2*sqrt(4*I)
*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^2*f*x^2 + 2*I*b^2*e*x + 2*I*a*
b*e - I*a^2*f)*log(-1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-
I*b^2*f*x^2 - 2*I*b^2*e*x - 2*I*a*b*e + I*a^2*f)*log(1/2*sqrt(-4*I)*(cosh(b
*x + a) + sinh(b*x + a)) + 1) + (-I*b^2*f*x^2 - 2*I*b^2*e*x - 2*I*a*b*e + I
*a^2*f)*log(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-2*I*a*
b*e + I*a^2*f)*log(I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (-2*I
*a*b*e + I*a^2*f)*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (
2*I*a*b*e - I*a^2*f)*log(I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a))
+ (2*I*a*b*e - I*a^2*f)*log(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x +
a)) - 2*I*f*polylog(3, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 2*I
```

```
*f*polylog(3, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*I*f*polyl
og(3, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*I*f*polylog(3, -1
/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))))/b^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (e + fx) \operatorname{acot}(\tanh(a + bx))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*acot(tanh(b*x+a)),x)
```

```
[Out] Integral((e + f*x)*acot(tanh(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx + e) \operatorname{arccot}(\tanh(bx + a))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*arccot(tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)*arccot(tanh(b*x + a)), x)
```

3.186 $\int \cot^{-1}(\tanh(a+bx))\,dx$

Optimal. Leaf size=73

$$-\frac{i\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}+\frac{i\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}+x\tan^{-1}\left(e^{2a+2bx}\right)+x\cot^{-1}(\tanh(a+bx))$$

```
[Out] x*ArcCot[Tanh[a + b*x]] + x*ArcTan[E^(2*a + 2*b*x)] - ((I/4)*PolyLog[2, (-I
)*E^(2*a + 2*b*x)])/b + ((I/4)*PolyLog[2, I*E^(2*a + 2*b*x)])/b
```

Rubi [A] time = 0.0412203, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5180, 4180, 2279, 2391}

$$-\frac{i\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}+\frac{i\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}+x\tan^{-1}\left(e^{2a+2bx}\right)+x\cot^{-1}(\tanh(a+bx))$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Tanh[a + b*x]],x]
```

```
[Out] x*ArcCot[Tanh[a + b*x]] + x*ArcTan[E^(2*a + 2*b*x)] - ((I/4)*PolyLog[2, (-I
)*E^(2*a + 2*b*x)])/b + ((I/4)*PolyLog[2, I*E^(2*a + 2*b*x)])/b
```

Rule 5180

```
Int[ArcCot[Tanh[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*ArcCot[Tanh[a + b
*x]], x] + Dist[b, Int[x*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b}, x]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \cot^{-1}(\tanh(a+bx))\,dx &= x\cot^{-1}(\tanh(a+bx)) + b\int x\text{sech}(2a+2bx)\,dx\\ &= x\cot^{-1}(\tanh(a+bx)) + x\tan^{-1}\left(e^{2a+2bx}\right) - \frac{1}{2}i\int \log\left(1-ie^{2a+2bx}\right)dx + \frac{1}{2}i\int \log\left(1+ie^{2a-}\right.\\ &= x\cot^{-1}(\tanh(a+bx)) + x\tan^{-1}\left(e^{2a+2bx}\right) - \frac{i\,\text{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{2a+2bx}\right)}{4b} + \frac{i\,\text{Subst}\left(\int\right.}{}\\ &= x\cot^{-1}(\tanh(a+bx)) + x\tan^{-1}\left(e^{2a+2bx}\right) - \frac{i\text{Li}_2\left(-ie^{2a+2bx}\right)}{4b} + \frac{i\text{Li}_2\left(ie^{2a+2bx}\right)}{4b}\end{aligned}$$

Mathematica [A] time = 0.0490017, size = 132, normalized size = 1.81

$$x\cot^{-1}(\tanh(a+bx)) + \frac{-2i\left(\text{PolyLog}\left(2,-ie^{2(a+bx)}\right) - \text{PolyLog}\left(2,ie^{2(a+bx)}\right)\right) - (-4ia-4ibx+\pi)\left(\log\left(1-ie^{2(a+bx)}\right) - \text{l}\right.}{8b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Tanh[a + b*x]],x]
```

```
[Out] x*ArcCot[Tanh[a + b*x]] + (-(((-4*I)*a + Pi - (4*I)*b*x)*(Log[1 - I*E^(2*(a
 + b*x))] - Log[1 + I*E^(2*(a + b*x))])) + ((-4*I)*a + Pi)*Log[Cot[((4*I)*a
 + Pi + (4*I)*b*x)/4]] - (2*I)*(PolyLog[2, (-I)*E^(2*(a + b*x))] - PolyLog[
2, I*E^(2*(a + b*x))]))/(8*b)
```

Maple [B] time = 0.17, size = 196, normalized size = 2.7

$$\frac{\text{Artanh}(\tanh(bx+a))\,\text{arccot}(\tanh(bx+a))}{b} + \frac{\arctan(\tanh(bx+a))\,\text{Artanh}(\tanh(bx+a))}{b} + \frac{\arctan(\tanh(bx+}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(tanh(b*x+a)),x)
```

```
[Out] 1/b*arctanh(tanh(b*x+a))*arccot(tanh(b*x+a))+1/b*arctan(tanh(b*x+a))*arctan
h(tanh(b*x+a))+1/2/b*arctan(tanh(b*x+a))*ln(1+I*(1+I*tanh(b*x+a))^2/(tanh(b
*x+a)^2+1))-1/4*I/b*polylog(2,-I*(1+I*tanh(b*x+a))^2/(tanh(b*x+a)^2+1))-1/2
/b*arctan(tanh(b*x+a))*ln(1-I*(1+I*tanh(b*x+a))^2/(tanh(b*x+a)^2+1))+1/4*I/
b*polylog(2,I*(1+I*tanh(b*x+a))^2/(tanh(b*x+a)^2+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$x \arctan\left(e^{(2\,bx+2\,a)}+1, e^{(2\,bx+2\,a)}-1\right)+2\,b\int\frac{xe^{(2\,bx+2\,a)}}{e^{(4\,bx+4\,a)}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] x*arctan2(e^(2*b*x + 2*a) + 1, e^(2*b*x + 2*a) - 1) + 2*b*integrate(x*e^(2*
b*x + 2*a)/(e^(4*b*x + 4*a) + 1), x)
```

Fricas [B] time = 2.73648, size = 1098, normalized size = 15.04

$$\frac{2\,bx\arctan\left(\frac{\cosh(bx+a)}{\sinh(bx+a)}\right)+(i\,bx+i\,a)\log\left(\frac{1}{2}\,\sqrt{4i}(\cosh\left(bx+a\right)+\sinh\left(bx+a\right))+1\right)+(i\,bx+i\,a)\log\left(-\frac{1}{2}\,\sqrt{4i}(\cosh\left(bx\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x*arctan(cosh(b*x + a)/sinh(b*x + a)) + (I*b*x + I*a)*log(1/2*sqrt
(4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b*x + I*a)*log(-1/2*sqrt(4*
I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b*x - I*a)*log(1/2*sqrt(-4*I)
*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b*x - I*a)*log(-1/2*sqrt(-4*I)*
(cosh(b*x + a) + sinh(b*x + a)) + 1) - I*a*log(I*sqrt(4*I) + 2*cosh(b*x + a
) + 2*sinh(b*x + a)) - I*a*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x
+ a)) + I*a*log(I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + I*a*log
(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + I*dilog(1/2*sqrt(4*I)
*(cosh(b*x + a) + sinh(b*x + a))) + I*dilog(-1/2*sqrt(4*I)*(cosh(b*x + a) +
 sinh(b*x + a))) - I*dilog(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)))
```

```
- I*dilog(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))))/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}(\tanh(a+bx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(tanh(b*x+a)),x)
```

```
[Out] Integral(acot(tanh(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}(\tanh(bx+a))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(tanh(b*x + a)), x)
```

3.187 $\int \frac{\cot^{-1}(\tanh(a+bx))}{e+fx} dx$

Optimal. Leaf size=17

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(\tanh(a+bx))}{e+fx},x\right)$$

```
[Out] CannotIntegrate[ArcCot[Tanh[a + b*x]]/(e + f*x), x]
```

Rubi [A] time = 0.0402191, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(\tanh(a+bx))}{e+fx} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[Tanh[a + b*x]]/(e + f*x),x]
```

```
[Out] Defer[Int][ArcCot[Tanh[a + b*x]]/(e + f*x), x]
```

Rubi steps

$$\int \frac{\cot^{-1}(\tanh(a+bx))}{e+fx} \, dx = \int \frac{\cot^{-1}(\tanh(a+bx))}{e+fx} \, dx$$

Mathematica [A] time = 0.750089, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(\tanh(a+bx))}{e+fx} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[Tanh[a + b*x]]/(e + f*x),x]
```

```
[Out] Integrate[ArcCot[Tanh[a + b*x]]/(e + f*x), x]
```

Maple [A] time = 0.936, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(\tanh(bx+a))}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(tanh(b*x+a))/(f*x+e),x)
```

```
[Out] int(arccot(tanh(b*x+a))/(f*x+e),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(\tanh(bx+a))}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(tanh(b*x+a))/(f*x+e),x, algorithm="maxima")
```

```
[Out] integrate(arccot(tanh(b*x + a))/(f*x + e), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}(\tanh(bx+a))}{fx+e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(tanh(b*x+a))/(f*x+e),x, algorithm="fricas")
```

```
[Out] integral(arccot(tanh(b*x + a))/(f*x + e), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(\tanh(a+bx))}{e+fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(tanh(b*x+a))/(f*x+e),x)
```

```
[Out] Integral(acot(tanh(a + b*x))/(e + f*x), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(\tanh(bx+a))}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(tanh(b*x+a))/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate(arccot(tanh(b*x + a))/(f*x + e), x)
```

3.188 $\int x^2 \cot^{-1}(c + d\tanh(a + bx))\,dx$

Optimal. Leaf size=355

$$\frac{ix\text{PolyLog}\left(3,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b^2}-\frac{ix\text{PolyLog}\left(3,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b^2}-\frac{i\text{PolyLog}\left(4,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^3}+\frac{i\text{PolyLog}\left(4,-\frac{(c+d+i)e}{c-d}\right.}{8b^3}$$

```
[Out] (x^3*ArcCot[c + d*Tanh[a + b*x]])/3 - (I/6)*x^3*Log[1 + ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/6)*x^3*Log[1 + ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x^2*PolyLog[2, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c
+ d))])/b + ((I/4)*x^2*PolyLog[2, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c -
d))])/b + ((I/4)*x*PolyLog[3, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))]
)/b^2 - ((I/4)*x*PolyLog[3, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/
b^2 - ((I/8)*PolyLog[4, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))])/b^3
+ ((I/8)*PolyLog[4, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/b^3
```

Rubi [A] time = 0.455425, antiderivative size = 355, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5200, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b^2}-\frac{ix\text{PolyLog}\left(3,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b^2}-\frac{i\text{PolyLog}\left(4,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^3}+\frac{i\text{PolyLog}\left(4,-\frac{(c+d+i)e}{c-d}\right.}{8b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + d*Tanh[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + d*Tanh[a + b*x]])/3 - (I/6)*x^3*Log[1 + ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/6)*x^3*Log[1 + ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x^2*PolyLog[2, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c
+ d))])/b + ((I/4)*x^2*PolyLog[2, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c -
d))])/b + ((I/4)*x*PolyLog[3, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))]
)/b^2 - ((I/4)*x*PolyLog[3, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/
b^2 - ((I/8)*PolyLog[4, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))])/b^3
+ ((I/8)*PolyLog[4, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/b^3
```

Rule 5200

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tanh[a + b*x]])/(f*(m
```

```
 + 1)), x] + (-Dist[(I*b*(I - c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E
^(2*a + 2*b*x))/(I - c + d + (I - c - d)*E^(2*a + 2*b*x)), x], x] + Dist[(I
*b*(I + c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*a + 2*b*x))/(I + c
 - d + (I + c + d)*E^(2*a + 2*b*x)), x], x]) /; FreeQ[{a, b, c, d, e, f}, x
] && IGtQ[m, 0] && NeQ[(c - d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c+d\tanh(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{3}(b(1-i(c+d)))\int \frac{e^{2a+2bx}x^3}{i+c-d+(i+c+d)e^{2a+2bx}}$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

$$= \frac{1}{3}x^3\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{6}ix^3\log\left(1+\right.$$

Mathematica [A] time = 5.11512, size = 305, normalized size = 0.86

$$\frac{1}{3}x^3\cot^{-1}(d\tanh(a+bx)+c) - \frac{i\left(6b^2x^2\text{PolyLog}\left(2,-\frac{(c+d-i)e^{2(a+bx)}}{c-d-i}\right) - 6b^2x^2\text{PolyLog}\left(2,-\frac{(c+d+i)e^{2(a+bx)}}{c-d+i}\right) - 6bx\text{PolyLog}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + d*Tanh[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + d*Tanh[a + b*x]])/3 - ((I/24)*(4*b^3*x^3*Log[1 + ((-I + c +
 d)*E^(2*(a + b*x)))/(-I + c - d)] - 4*b^3*x^3*Log[1 + ((I + c + d)*E^(2*(a
 + b*x)))/(I + c - d)] + 6*b^2*x^2*PolyLog[2, -(((-I + c + d)*E^(2*(a + b*x
)))/(-I + c - d))] - 6*b^2*x^2*PolyLog[2, -(((I + c + d)*E^(2*(a + b*x)))/(
I + c - d))] - 6*b*x*PolyLog[3, -(((-I + c + d)*E^(2*(a + b*x)))/(-I + c -
d))] + 6*b*x*PolyLog[3, -(((I + c + d)*E^(2*(a + b*x)))/(I + c - d))] + 3*P
olyLog[4, -(((-I + c + d)*E^(2*(a + b*x)))/(-I + c - d))] - 3*PolyLog[4, -(
((I + c + d)*E^(2*(a + b*x)))/(I + c - d))]))/b^3
```

Maple [C] time = 10.428, size = 6930, normalized size = 19.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+d*tanh(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\,x^3\arctan\left(e^{(2\,bx+2\,a)}+1,\left(ce^{(2\,a)}+de^{(2\,a)}\right)e^{(2\,bx)}+c-d\right)+4\,bd\int\frac{x^3e^{(2\,bx+}}{3\left(c^2-2\,cd+d^2+\left(c^2e^{(4\,a)}+2\,cde^{(4\,a)}+d^2e^{(4\,a)}+e^{(4}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arctan2(e^(2*b*x + 2*a) + 1, (c*e^(2*a) + d*e^(2*a))*e^(2*b*x) + c
- d) + 4*b*d*integrate(1/3*x^3*e^(2*b*x + 2*a)/(c^2 - 2*c*d + d^2 + (c^2*e^
(4*a) + 2*c*d*e^(4*a) + d^2*e^(4*a) + e^(4*a))*e^(4*b*x) + 2*(c^2*e^(2*a) -
 d^2*e^(2*a) + e^(2*a))*e^(2*b*x) + 1), x)
```

Fricas [C] time = 3.26864, size = 3641, normalized size = 10.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^3*arctan(cosh(b*x + a)/(c*cosh(b*x + a) + d*sinh(b*x + a))) -
3*I*b^2*x^2*dilog(1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2
+ 1))*(cosh(b*x + a) + sinh(b*x + a))) - 3*I*b^2*x^2*dilog(-1/2*sqrt(-(4*c^
2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x +
 a))) + 3*I*b^2*x^2*dilog(1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*
d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 3*I*b^2*x^2*dilog(-1/2*sqr
t(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + si
nh(b*x + a))) + I*a^3*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2
+ 2*c*d + d^2 + 1)*sinh(b*x + a) + (c^2 - d^2 - 2*I*d + 1)*sqrt(-(4*c^2 - 4
*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + I*a^3*log(2*(c^2 + 2*c*d + d^
2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2
```

```
 - 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) -
 I*a^3*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 +
 1)*sinh(b*x + a) + (c^2 - d^2 + 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 - 8*I*d +
4)/(c^2 - 2*c*d + d^2 + 1))) - I*a^3*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x
 + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 + 2*I*d + 1)*s
qrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + 6*I*b*x*polylo
g(3, 1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b
*x + a) + sinh(b*x + a))) + 6*I*b*x*polylog(3, -1/2*sqrt(-(4*c^2 - 4*d^2 +
8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) - 6*I*
b*x*polylog(3, 1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1
))*(cosh(b*x + a) + sinh(b*x + a))) - 6*I*b*x*polylog(3, -1/2*sqrt(-(4*c^2
- 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a
))) + (-I*b^3*x^3 - I*a^3)*log(1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 -
 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^3*x^3 - I*a
^3)*log(-1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(co
sh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^3*x^3 + I*a^3)*log(1/2*sqrt(-(4*c^
2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x +
 a)) + 1) + (I*b^3*x^3 + I*a^3)*log(-1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/
(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) - 6*I*polylog
(4, 1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*
x + a) + sinh(b*x + a))) - 6*I*polylog(4, -1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d
 + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 6*I*polyl
og(4, 1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(
b*x + a) + sinh(b*x + a))) + 6*I*polylog(4, -1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I
*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+d*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(d \tanh(bx + a) + c) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(d*tanh(b*x + a) + c), x)
```

3.189 $\int x \cot^{-1}(c + d \tanh(a + bx))\, dx$

Optimal. Leaf size=267

$$\frac{i\text{PolyLog}\left(3,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^2}-\frac{i\text{PolyLog}\left(3,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{8b^2}-\frac{ix\text{PolyLog}\left(2,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{ix\text{PolyLog}\left(2,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}$$

```
[Out] (x^2*ArcCot[c + d*Tanh[a + b*x]])/2 - (I/4)*x^2*Log[1 + ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/4)*x^2*Log[1 + ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x*PolyLog[2, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c +
d))])/b + ((I/4)*x*PolyLog[2, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))]
)/b + ((I/8)*PolyLog[3, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))])/b^2
- ((I/8)*PolyLog[3, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/b^2
```

Rubi [A] time = 0.375928, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {5200, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^2}-\frac{i\text{PolyLog}\left(3,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{8b^2}-\frac{ix\text{PolyLog}\left(2,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{ix\text{PolyLog}\left(2,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + d*Tanh[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Tanh[a + b*x]])/2 - (I/4)*x^2*Log[1 + ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/4)*x^2*Log[1 + ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x*PolyLog[2, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c +
d))])/b + ((I/4)*x*PolyLog[2, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))]
)/b + ((I/8)*PolyLog[3, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))])/b^2
- ((I/8)*PolyLog[3, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/b^2
```

Rule 5200

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tanh[a + b*x]])/(f*(m
 + 1)), x] + (-Dist[(I*b*(I - c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E
^(2*a + 2*b*x))/(I - c + d + (I - c - d)*E^(2*a + 2*b*x)), x], x] + Dist[(I
*b*(I + c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*a + 2*b*x))/(I + c
 - d + (I + c + d)*E^(2*a + 2*b*x)), x], x]) /; FreeQ[{a, b, c, d, e, f}, x
```

```
] && IGtQ[m, 0] && NeQ[(c - d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+d\tanh(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{2}(b(1-i(c+d)))\int \frac{e^{2a+2bx}x^2}{i+c-d+(i+c+d)e^{2a+2bx}}\,dx$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1+\frac{(i$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1+\frac{(i$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1+\frac{(i$$
$$= \frac{1}{2}x^2\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{4}ix^2\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1+\frac{(i$$

Mathematica [A] time = 3.92955, size = 229, normalized size = 0.86

$$\frac{1}{2}x^2\cot^{-1}(d\tanh(a+bx)+c) - \frac{i\left(2bx\text{PolyLog}\left(2,-\frac{(c+d-i)e^{2(a+bx)}}{c-d-i}\right) - 2bx\text{PolyLog}\left(2,-\frac{(c+d+i)e^{2(a+bx)}}{c-d+i}\right) - \text{PolyLog}\left(3,-\frac{(c+}{}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + d*Tanh[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Tanh[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 + ((-I + c +
d)*E^(2*(a + b*x)))/(-I + c - d)] - 2*b^2*x^2*Log[1 + ((I + c + d)*E^(2*(a
+ b*x)))/(I + c - d)] + 2*b*x*PolyLog[2, -(((-I + c + d)*E^(2*(a + b*x)))/(
-I + c - d))] - 2*b*x*PolyLog[2, -(((I + c + d)*E^(2*(a + b*x)))/(I + c - d
))] - PolyLog[3, -(((-I + c + d)*E^(2*(a + b*x)))/(-I + c - d))] + PolyLog[
3, -(((I + c + d)*E^(2*(a + b*x)))/(I + c - d))]))/b^2
```

Maple [C] time = 21.403, size = 6580, normalized size = 24.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+d*tanh(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}x^2\arctan\left(e^{(2bx+2a)}+1,\left(ce^{(2a)}+de^{(2a)}\right)e^{(2bx)}+c-d\right)+2bd\int\frac{x^2e^{(2bx+2a)}}{c^2-2cd+d^2+\left(c^2e^{(4a)}+2cde^{(4a)}+d^2e^{(4a)}+e^{(4a)}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arctan2(e^(2*b*x + 2*a) + 1, (c*e^(2*a) + d*e^(2*a))*e^(2*b*x) + c
- d) + 2*b*d*integrate(x^2*e^(2*b*x + 2*a)/(c^2 - 2*c*d + d^2 + (c^2*e^(4*a
) + 2*c*d*e^(4*a) + d^2*e^(4*a) + e^(4*a))*e^(4*b*x) + 2*(c^2*e^(2*a) - d^2
*e^(2*a) + e^(2*a))*e^(2*b*x) + 1), x)
```

Fricas [C] time = 3.01131, size = 2985, normalized size = 11.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*b^2*x^2*arctan(cosh(b*x + a)/(c*cosh(b*x + a) + d*sinh(b*x + a))) -
2*I*b*x*dilog(1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1)
)*(cosh(b*x + a) + sinh(b*x + a))) - 2*I*b*x*dilog(-1/2*sqrt(-(4*c^2 - 4*d^
2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) +
2*I*b*x*dilog(1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1)
)*(cosh(b*x + a) + sinh(b*x + a))) + 2*I*b*x*dilog(-1/2*sqrt(-(4*c^2 - 4*d^
2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) -
I*a^2*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 +
1)*sinh(b*x + a) + (c^2 - d^2 - 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4
)/(c^2 - 2*c*d + d^2 + 1))) - I*a^2*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x
+ a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 - 2*I*d + 1)*sq
rt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + I*a^2*log(2*(c^
2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a
) + (c^2 - d^2 + 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d
+ d^2 + 1))) + I*a^2*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 +
```

```
 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 + 2*I*d + 1)*sqrt(-(4*c^2 - 4*
d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + (-I*b^2*x^2 + I*a^2)*log(1/2*s
qrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) +
sinh(b*x + a)) + 1) + (-I*b^2*x^2 + I*a^2)*log(-1/2*sqrt(-(4*c^2 - 4*d^2 +
8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) +
(I*b^2*x^2 - I*a^2)*log(1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d
+ d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^2*x^2 - I*a^2)*log(
-1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x +
 a) + sinh(b*x + a)) + 1) + 2*I*polylog(3, 1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d
 + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 2*I*polyl
og(3, -1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh
(b*x + a) + sinh(b*x + a))) - 2*I*polylog(3, 1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I
*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) - 2*I*pol
ylog(3, -1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(co
sh(b*x + a) + sinh(b*x + a))))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+d*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left(d \tanh\left(bx + a\right) + c\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(d*tanh(b*x + a) + c), x)
```

3.190 $\int \cot^{-1}(c + d\tanh(a + bx))\,dx$

Optimal. Leaf size=174

$$-\frac{i\text{PolyLog}\left(2,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{i\text{PolyLog}\left(2,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}-\frac{1}{2}ix\log\left(1+\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)+\frac{1}{2}ix\log\left(1+\frac{(c+d}{c}\right.$$

```
[Out] x*ArcCot[c + d*Tanh[a + b*x]] - (I/2)*x*Log[1 + ((I - c - d)*E^(2*a + 2*b*x
))/(I - c + d)] + (I/2)*x*Log[1 + ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)
] - ((I/4)*PolyLog[2, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))])/b + ((
I/4)*PolyLog[2, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/b
```

Rubi [A] time = 0.222279, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {5192, 2190, 2279, 2391}

$$-\frac{i\text{PolyLog}\left(2,-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{i\text{PolyLog}\left(2,-\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}-\frac{1}{2}ix\log\left(1+\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)+\frac{1}{2}ix\log\left(1+\frac{(c+d}{c}\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + d*Tanh[a + b*x]],x]
```


```
[Out] x*ArcCot[c + d*Tanh[a + b*x]] - (I/2)*x*Log[1 + ((I - c - d)*E^(2*a + 2*b*x
))/(I - c + d)] + (I/2)*x*Log[1 + ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)
] - ((I/4)*PolyLog[2, -(((I - c - d)*E^(2*a + 2*b*x))/(I - c + d))])/b + ((
I/4)*PolyLog[2, -(((I + c + d)*E^(2*a + 2*b*x))/(I + c - d))])/b
```


Rule 5192

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*Arc
Cot[c + d*Tanh[a + b*x]], x] + (-Dist[I*b*(I - c - d), Int[(x*E^(2*a + 2*b*
x))/(I - c + d + (I - c - d)*E^(2*a + 2*b*x)), x], x] + Dist[I*b*(I + c + d
), Int[(x*E^(2*a + 2*b*x))/(I + c - d + (I + c + d)*E^(2*a + 2*b*x)), x], x
]) /; FreeQ[{a, b, c, d}, x] && NeQ[(c - d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+d\tanh(a+bx))\,dx = x\cot^{-1}(c+d\tanh(a+bx)) - (b(1-i(c+d)))\int \frac{e^{2a+2bx}x}{i+c-d+(i+c+d)e^{2a+2bx}}\,dx + (b($$

$$= x\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{2}ix\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{2}ix\log\left(1+\frac{(i+c+}{i+c}\right.$$

$$= x\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{2}ix\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{2}ix\log\left(1+\frac{(i+c+}{i+c}\right.$$

$$= x\cot^{-1}(c+d\tanh(a+bx)) - \frac{1}{2}ix\log\left(1+\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{2}ix\log\left(1+\frac{(i+c+}{i+c}\right.$$

Mathematica [A] time = 1.3467, size = 288, normalized size = 1.66

$$x\cot^{-1}(d\tanh(a+bx)+c) - \frac{d\text{PolyLog}\left(2,-\frac{\left(c^2+2cd+d^2+1\right)e^{2(a+bx)}}{c^2-d^2+2\sqrt{-d^2}+1}\right) - d\text{PolyLog}\left(2,\frac{\left(c^2+2cd+d^2+1\right)e^{2(a+bx)}}{-c^2+d^2+2\sqrt{-d^2}-1}\right) - 2d(a+bx)\log\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[c + d*Tanh[a + b*x]],x]
```

```
[Out] x*ArcCot[c + d*Tanh[a + b*x]] - (4*a*Sqrt[-d^2]*ArcTan[(1 + c^2 - d^2 + (1
+ c^2 + 2*c*d + d^2)*E^(2*(a + b*x)))/(2*d)] - 2*d*(a + b*x)*Log[1 + (2*(1
```

```
+ (c + d)^2)*E^(2*(a + b*x)))/(2 + 2*c^2 - 2*d^2 - 4*Sqrt[-d^2])] + 2*d*(a
+ b*x)*Log[1 + ((1 + (c + d)^2)*E^(2*(a + b*x)))/(1 + c^2 - d^2 + 2*Sqrt[-d
^2])] + d*PolyLog[2, -(((1 + c^2 + 2*c*d + d^2)*E^(2*(a + b*x)))/(1 + c^2 -
 d^2 + 2*Sqrt[-d^2]))] - d*PolyLog[2, ((1 + c^2 + 2*c*d + d^2)*E^(2*(a + b*
x)))/(-1 - c^2 + d^2 + 2*Sqrt[-d^2])])/(4*b*Sqrt[-d^2])
```

Maple [B] time = 0.097, size = 350, normalized size = 2.

$$-\frac{\operatorname{arccot}\left(c+d\tanh\left(bx+a\right)\right)\ln\left(d\tanh\left(bx+a\right)-d\right)}{2b}+\frac{\operatorname{arccot}\left(c+d\tanh\left(bx+a\right)\right)\ln\left(d\tanh\left(bx+a\right)+d\right)}{2b}+\frac{\frac{i}{4}\ln(d}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*tanh(b*x+a)),x)
```

```
[Out] -1/2/b*arccot(c+d*tanh(b*x+a))*ln(d*tanh(b*x+a)-d)+1/2/b*arccot(c+d*tanh(b*
x+a))*ln(d*tanh(b*x+a)+d)+1/4*I/b*ln(d*tanh(b*x+a)-d)*ln((-d*tanh(b*x+a)+I-
c)/(I-c-d))-1/4*I/b*ln(d*tanh(b*x+a)-d)*ln((d*tanh(b*x+a)+c+I)/(I+c+d))+1/4
*I/b*dilog((-d*tanh(b*x+a)+I-c)/(I-c-d))-1/4*I/b*dilog((d*tanh(b*x+a)+c+I)/
(I+c+d))-1/4*I/b*ln(d*tanh(b*x+a)+d)*ln((-d*tanh(b*x+a)+I-c)/(I-c+d))+1/4*I
/b*ln(d*tanh(b*x+a)+d)*ln((d*tanh(b*x+a)+c+I)/(I+c-d))-1/4*I/b*dilog((-d*ta
nh(b*x+a)+I-c)/(I-c+d))+1/4*I/b*dilog((d*tanh(b*x+a)+c+I)/(I+c-d))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$4\,bd\int\frac{xe^{(2\,bx+2\,a)}}{c^2-2\,cd+d^2+\left(c^2e^{(4\,a)}+2\,cde^{(4\,a)}+d^2e^{(4\,a)}+e^{(4\,a)}\right)e^{(4\,bx)}+2\left(c^2e^{(2\,a)}-d^2e^{(2\,a)}+e^{(2\,a)}\right)e^{(2\,bx)}+1}\,dx+x\arctan($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 4*b*d*integrate(x*e^(2*b*x + 2*a)/(c^2 - 2*c*d + d^2 + (c^2*e^(4*a) + 2*c*d
*e^(4*a) + d^2*e^(4*a) + e^(4*a))*e^(4*b*x) + 2*(c^2*e^(2*a) - d^2*e^(2*a)
+ e^(2*a))*e^(2*b*x) + 1), x) + x*arctan2(e^(2*b*x + 2*a) + 1, (c*e^(2*a) +
 d*e^(2*a))*e^(2*b*x) + c - d)
```

Fricas [B] time = 6.68202, size = 2288, normalized size = 13.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x*arctan(cosh(b*x + a)/(c*cosh(b*x + a) + d*sinh(b*x + a))) + I*a*
log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sin
h(b*x + a) + (c^2 - d^2 - 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2
 - 2*c*d + d^2 + 1))) + I*a*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2
*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 - 2*I*d + 1)*sqrt(-(4*c
^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) - I*a*log(2*(c^2 + 2*c*d
+ d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) + (c^2 -
 d^2 + 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1)
)) - I*a*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2
 + 1)*sinh(b*x + a) - (c^2 - d^2 + 2*I*d + 1)*sqrt(-(4*c^2 - 4*d^2 - 8*I*d
+ 4)/(c^2 - 2*c*d + d^2 + 1))) + (-I*b*x - I*a)*log(1/2*sqrt(-(4*c^2 - 4*d^
2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1
) + (-I*b*x - I*a)*log(-1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d
+ d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b*x + I*a)*log(1/2*sq
rt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + s
inh(b*x + a)) + 1) + (I*b*x + I*a)*log(-1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d +
4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) - I*dilog(
1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x +
a) + sinh(b*x + a))) - I*dilog(-1/2*sqrt(-(4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2
- 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + I*dilog(1/2*sqrt(-(4
*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*
x + a))) + I*dilog(-1/2*sqrt(-(4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^
2 + 1))*(cosh(b*x + a) + sinh(b*x + a))))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(d\tanh\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(d*tanh(b*x + a) + c), x)
```

3.191 $\int \frac{\cot^{-1}(c+d\tanh(a+bx))}{x}\,dx$

Optimal. Leaf size=17

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(d\tanh(a+bx)+c)}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + d*Tanh[a + b*x]]/x, x]
```

Rubi [A] time = 0.0806673, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c+d\tanh(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + d*Tanh[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + d*Tanh[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+d\tanh(a+bx))}{x}\,dx = \int \frac{\cot^{-1}(c+d\tanh(a+bx))}{x}\,dx$$

Mathematica [A] time = 5.10422, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+d\tanh(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + d*Tanh[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + d*Tanh[a + b*x]]/x, x]
```

Maple [A] time = 0.447, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c+d\tanh\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*tanh(b*x+a))/x,x)
```

```
[Out] int(arccot(c+d*tanh(b*x+a))/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(d\tanh\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tanh(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] integrate(arccot(d*tanh(b*x + a) + c)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\operatorname{arccot}\left(d\tanh\left(bx+a\right)+c\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tanh(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(d*tanh(b*x + a) + c)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*tanh(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(d\tanh\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*tanh(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(d*tanh(b*x + a) + c)/x, x)
```

3.192 $\int x^2 \cot^{-1}(c+(i+c)\tanh(a+bx))\,dx$

Optimal. Leaf size=142

$$\frac{ix\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{4b^2}-\frac{i\text{PolyLog}\left(4,-ice^{2a+2bx}\right)}{8b^3}-\frac{ix^2\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}-\frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right)+\frac{1}{3}x^3\text{co}$$

```
[Out] (I/12)*b*x^4 + (x^3*ArcCot[c + (I + c)*Tanh[a + b*x]])/3 - (I/6)*x^3*Log[1
+ I*c*E^(2*a + 2*b*x)] - ((I/4)*x^2*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b +
 ((I/4)*x*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2 - ((I/8)*PolyLog[4, (-I)*
c*E^(2*a + 2*b*x)])/b^3
```

Rubi [A] time = 0.227638, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {5196, 2184, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{4b^2}-\frac{i\text{PolyLog}\left(4,-ice^{2a+2bx}\right)}{8b^3}-\frac{ix^2\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}-\frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right)+\frac{1}{3}x^3\text{co}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + (I + c)*Tanh[a + b*x]],x]
```

```
[Out] (I/12)*b*x^4 + (x^3*ArcCot[c + (I + c)*Tanh[a + b*x]])/3 - (I/6)*x^3*Log[1
+ I*c*E^(2*a + 2*b*x)] - ((I/4)*x^2*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b +
 ((I/4)*x*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2 - ((I/8)*PolyLog[4, (-I)*
c*E^(2*a + 2*b*x)])/b^3
```

Rule 5196

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tanh[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d + c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c+(i+c)\tanh(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) + \frac{1}{3}b\int \frac{x^3}{-i+ce^{2a+2bx}}\,dx$$
$$= \frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{3}(ibc)\int \frac{e^{2a+2bx}x^3}{-i+ce^{2a+2bx}}\,dx$$
$$= \frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) + \frac{1}{2}i$$
$$= \frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) - \frac{ix^2}{}$$
$$= \frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) - \frac{ix^2}{}$$
$$= \frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) - \frac{ix^2}{}$$
$$= \frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) - \frac{ix^2}{}$$

Mathematica [A] time = 0.176547, size = 128, normalized size = 0.9

$$\frac{1}{3}x^3\cot^{-1}(c+(c+i)\tanh(a+bx)) - \frac{i\left(-6b^2x^2\text{PolyLog}\left(2,\frac{ie^{-2(a+bx)}}{c}\right) - 6bx\text{PolyLog}\left(3,\frac{ie^{-2(a+bx)}}{c}\right) - 3\text{PolyLog}\left(4,\frac{ie^{-2(a+}}{c}\right.\right.}{24b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + (I + c)*Tanh[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + (I + c)*Tanh[a + b*x]])/3 - ((I/24)*(4*b^3*x^3*Log[1 - I/(c
*E^(2*(a + b*x)))] - 6*b^2*x^2*PolyLog[2, I/(c*E^(2*(a + b*x)))] - 6*b*x*Po
lyLog[3, I/(c*E^(2*(a + b*x)))] - 3*PolyLog[4, I/(c*E^(2*(a + b*x)))]))/b^3
```

Maple [C] time = 17.627, size = 1549, normalized size = 10.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+(I+c)*tanh(b*x+a)),x)
```

```
[Out] -1/3*I/b^3*c*a^3/(I+c)*ln(exp(b*x+a))+1/3*I/b^2*c/(I+c)*x*a^3+1/12*Pi*x^3*c
sgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))*csgn((2*exp(2*b*x+2*a)*c
-2*I)/(exp(2*b*x+2*a)+1))+1/12*Pi*x^3*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*
x+2*a)*c))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1
))^2+1/12*Pi*x^3*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+
2*a)+1))*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2
-1/12*Pi*x^3*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)
+1))^3+1/12*Pi*x^3*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^2+1/2*
I/b^2*ln(1+I*c*exp(2*b*x+2*a))*x*a^2-1/2*I/b^2*a^2*ln(1+I*exp(b*x+a)*(I*c)^
(1/2))*x-1/2*I/b^2*a^2*ln(1-I*exp(b*x+a)*(I*c)^(1/2))*x-1/8*I*polylog(4,-I*
c*exp(2*b*x+2*a))/b^3+1/12*I*b*c/(I+c)*x^4+1/4*I/b^3*c/(I+c)*a^4-1/12*Pi*x^
3*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))*csgn((
2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))-1/12*Pi*x^3*csgn
(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))*csgn((2*exp(2*b*x+2*a)*c-2*
I)/(exp(2*b*x+2*a)+1))^2+1/6*I/b^3*a^3*ln(-exp(2*b*x+2*a)*c+I)+1/3/b^3*a^3/
(I+c)*ln(exp(b*x+a))-1/3/b^2/(I+c)*x*a^3+1/4*I*x*polylog(3,-I*c*exp(2*b*x+2
*a))/b^2-1/12*Pi*x^3*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*
x+2*a)+1))^3-1/12*Pi*x^3*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^
3-1/6*I*x^3*ln(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)+1/6*I*x^3*ln(2*exp(2*
b*x+2*a)*c-2*I)-1/6*I*x^3*ln(1+I*c*exp(2*b*x+2*a))+1/12*Pi*x^3*csgn(I*(2*ex
p(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^3+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a
)+1))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp
(2*b*x+2*a)+1))-1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(2*I*exp(2*b*
x+2*a)+2*exp(2*b*x+2*a)*c))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/
(exp(2*b*x+2*a)+1))-1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(2*exp(2*
b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^2+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)+1)
)*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2-1/12
*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c-2*I))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(e
xp(2*b*x+2*a)+1))^2+1/12*Pi*x^3*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c
)/(exp(2*b*x+2*a)+1))^2-1/4*I*x^2*polylog(2,-I*c*exp(2*b*x+2*a))/b-1/4/b^3/
(I+c)*a^4-1/12*b/(I+c)*x^4+1/3*I/b^3*ln(1+I*c*exp(2*b*x+2*a))*a^3+1/4*I/b^3
*polylog(2,-I*c*exp(2*b*x+2*a))*a^2-1/2*I/b^3*a^3*ln(1+I*exp(b*x+a)*(I*c)^(
1/2))-1/2*I/b^3*a^3*ln(1-I*exp(b*x+a)*(I*c)^(1/2))-1/2*I/b^3*a^2*dilog(1+I*
exp(b*x+a)*(I*c)^(1/2))-1/2*I/b^3*a^2*dilog(1-I*exp(b*x+a)*(I*c)^(1/2))
```

Maxima [A] time = 5.76678, size = 174, normalized size = 1.23

$$\frac{1}{3}x^3 \operatorname{arccot}\left((c+i)\tanh(bx+a)+c\right) - \frac{4}{9}\left(\frac{3x^4}{4ic-4} - \frac{4b^3x^3\log\left(ice^{(2bx+2a)}+1\right)+6b^2x^2\mathrm{Li}_2\left(-ice^{(2bx+2a)}\right)-6bx\mathrm{Li}_3(-i}{-2b^4(-ic+1)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot((c + I)*tanh(b*x + a) + c) - 4/9*(3*x^4/(4*I*c - 4) - (4*b^3
*x^3*log(I*c*e^(2*b*x + 2*a) + 1) + 6*b^2*x^2*dilog(-I*c*e^(2*b*x + 2*a)) -
 6*b*x*polylog(3, -I*c*e^(2*b*x + 2*a)) + 3*polylog(4, -I*c*e^(2*b*x + 2*a)
))/(b^4*(2*I*c - 2)))*b*(c + I)
```

Fricas [C] time = 2.24497, size = 869, normalized size = 6.12

$$\frac{i b^4x^4 + 2i b^3x^3 \log\left(\frac{\left(ce^{(2bx+2a)}-i\right)e^{(-2bx-2a)}}{c+i}\right) - 6i b^2x^2\mathrm{Li}_2\left(\frac{1}{2}\sqrt{-4i c}e^{(bx+a)}\right) - 6i b^2x^2\mathrm{Li}_2\left(-\frac{1}{2}\sqrt{-4i c}e^{(bx+a)}\right) - i a^4 + 2i a^3 \log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(I*b^4*x^4 + 2*I*b^3*x^3*log((c*e^(2*b*x + 2*a) - I)*e^(-2*b*x - 2*a)/
(c + I)) - 6*I*b^2*x^2*dilog(1/2*sqrt(-4*I*c)*e^(b*x + a)) - 6*I*b^2*x^2*di
log(-1/2*sqrt(-4*I*c)*e^(b*x + a)) - I*a^4 + 2*I*a^3*log(1/2*(2*c*e^(b*x +
a) + I*sqrt(-4*I*c))/c) + 2*I*a^3*log(1/2*(2*c*e^(b*x + a) - I*sqrt(-4*I*c)
)/c) + 12*I*b*x*polylog(3, 1/2*sqrt(-4*I*c)*e^(b*x + a)) + 12*I*b*x*polylog
(3, -1/2*sqrt(-4*I*c)*e^(b*x + a)) + (-2*I*b^3*x^3 - 2*I*a^3)*log(1/2*sqrt(
-4*I*c)*e^(b*x + a) + 1) + (-2*I*b^3*x^3 - 2*I*a^3)*log(-1/2*sqrt(-4*I*c)*e
^(b*x + a) + 1) - 12*I*polylog(4, 1/2*sqrt(-4*I*c)*e^(b*x + a)) - 12*I*poly
log(4, -1/2*sqrt(-4*I*c)*e^(b*x + a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+(I+c)*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}((c+i)\tanh(bx+a)+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot((c + I)*tanh(b*x + a) + c), x)
```

3.193 $\int x\cot^{-1}(c+(i+c)\tanh(a+bx))\,dx$

Optimal. Leaf size=113

$$\frac{i\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{8b^2}-\frac{ix\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}-\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{1}{2}x^2\cot^{-1}(c+(c+i)\tanh(a+bx))+$$

```
[Out] (I/6)*b*x^3 + (x^2*ArcCot[c + (I + c)*Tanh[a + b*x]])/2 - (I/4)*x^2*Log[1 +
 I*c*E^(2*a + 2*b*x)] - ((I/4)*x*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b + ((
I/8)*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2
```

Rubi [A] time = 0.197445, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353, Rules used = {5196, 2184, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{8b^2}-\frac{ix\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}-\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{1}{2}x^2\cot^{-1}(c+(c+i)\tanh(a+bx))+$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + (I + c)*Tanh[a + b*x]],x]
```

```
[Out] (I/6)*b*x^3 + (x^2*ArcCot[c + (I + c)*Tanh[a + b*x]])/2 - (I/4)*x^2*Log[1 +
 I*c*E^(2*a + 2*b*x)] - ((I/4)*x*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b + ((
I/8)*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2
```

Rule 5196

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tanh[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d + c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+(i+c)\tanh(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+(i+c)\tanh(a+bx))+\frac{1}{2}b\int\frac{x^2}{-i+ce^{2a+2bx}}\,dx$$
$$=\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c+(i+c)\tanh(a+bx))-\frac{1}{2}(ibc)\int\frac{e^{2a+2bx}x^2}{-i+ce^{2a+2bx}}\,dx$$
$$=\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c+(i+c)\tanh(a+bx))-\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{1}{2}i\int$$
$$=\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c+(i+c)\tanh(a+bx))-\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)-\frac{ix\mathrm{Li}_2}{}$$
$$=\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c+(i+c)\tanh(a+bx))-\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)-\frac{ix\mathrm{Li}_2}{}$$
$$=\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c+(i+c)\tanh(a+bx))-\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)-\frac{ix\mathrm{Li}_2}{}$$

Mathematica [A] time = 0.0864655, size = 102, normalized size = 0.9

$$\frac{1}{2}x^2\cot^{-1}(c+(c+i)\tanh(a+bx))-\frac{i\left(-2bx\text{PolyLog}\left(2,\frac{ie^{-2(a+bx)}}{c}\right)-\text{PolyLog}\left(3,\frac{ie^{-2(a+bx)}}{c}\right)+2b^2x^2\log\left(1-\frac{ie^{-2(a+bx)}}{c}\right)\right)}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + (I + c)*Tanh[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (I + c)*Tanh[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 - I/(c*
E^(2*(a + b*x)))] - 2*b*x*PolyLog[2, I/(c*E^(2*(a + b*x)))] - PolyLog[3, I/
(c*E^(2*(a + b*x)))]))/b^2
```

Maple [C] time = 8.242, size = 1513, normalized size = 13.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+(I+c)*tanh(b*x+a)),x)
```

```
[Out] 1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^3-1/2/b^2*a^
2/(I+c)*ln(exp(b*x+a))+1/2/b/(I+c)*x*a^2-1/4*I/b^2*ln(1+I*c*exp(2*b*x+2*a))
*a^2-1/4*I/b^2*polylog(2,-I*c*exp(2*b*x+2*a))*a+1/2*I/b^2*a^2*ln(1+I*exp(b*
```

```
x+a)*(I*c)^(1/2))+1/2*I/b^2*a^2*ln(1-I*exp(b*x+a)*(I*c)^(1/2))+1/2*I/b^2*a*
dilog(1+I*exp(b*x+a)*(I*c)^(1/2))+1/2*I/b^2*a*dilog(1-I*exp(b*x+a)*(I*c)^(1
/2))+1/8*I*polylog(3,-I*c*exp(2*b*x+2*a))/b^2-1/3*I/b^2*c/(I+c)*a^3+1/6*I*b
*c/(I+c)*x^3-1/8*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp
(2*b*x+2*a)+1))^3+1/2*I/b*a*ln(1+I*exp(b*x+a)*(I*c)^(1/2))*x-1/8*Pi*x^2*csg
n(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))*csgn((2*exp(2*b*x+2*a)*c-2
*I)/(exp(2*b*x+2*a)+1))^2-1/4*I*x^2*ln(1+I*c*exp(2*b*x+2*a))+1/4*I*x^2*ln(2
*exp(2*b*x+2*a)*c-2*I)-1/8*Pi*x^2*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)
*c)/(exp(2*b*x+2*a)+1))^3-1/8*Pi*x^2*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b
*x+2*a)+1))^3+1/3/b^2/(I+c)*a^3-1/6*b/(I+c)*x^3+1/2*I/b*a*ln(1-I*exp(b*x+a)
*(I*c)^(1/2))*x-1/4*I*x^2*ln(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)-1/4*I*x
*polylog(2,-I*c*exp(2*b*x+2*a))/b-1/4*I/b^2*a^2*ln(-exp(2*b*x+2*a)*c+I)-1/8
*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))*
csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))+1/8*Pi*x^2
*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^2+1/8*Pi*x^2*csgn((2*I*e
xp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2-1/8*Pi*x^2*csgn(I/(
exp(2*b*x+2*a)+1))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^2+1/
8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))*csgn((2*exp(2*
b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))+1/8*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2
*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x
+2*a)*c)/(exp(2*b*x+2*a)+1))^2+1/8*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(
2*b*x+2*a)*c))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*
a)+1))^2+1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(2*I*exp(2*b*x+2*a)+2
*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2-1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a
)*c-2*I))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))^2-1/2*I/b*ln(
1+I*c*exp(2*b*x+2*a))*x*a+1/2*I/b^2*c*a^2/(I+c)*ln(exp(b*x+a))-1/2*I/b*c/(I
+c)*x*a^2+1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(2*exp(2*b*x+2*a)*c-
2*I))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)+1))-1/8*Pi*x^2*csgn(I
/(exp(2*b*x+2*a)+1))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c))*csgn(I
*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))
```

Maxima [A] time = 5.78706, size = 144, normalized size = 1.27

$$-\left(\frac{2\,x^3}{3i\,c-3}-\frac{2\,b^2x^2\log\left(i\,ce^{(2\,bx+2\,a)}+1\right)+2\,bx\mathrm{Li}_2\left(-i\,ce^{(2\,bx+2\,a)}\right)-\mathrm{Li}_3(-i\,ce^{(2\,bx+2\,a)})}{-2\,b^3(-i\,c+1)}\right)b(c+i)+\frac{1}{2}\,x^2\,\mathrm{arccot}\left((c+i)\tanh\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] -(2*x^3/(3*I*c - 3) - (2*b^2*x^2*log(I*c*e^(2*b*x + 2*a) + 1) + 2*b*x*dilog
(-I*c*e^(2*b*x + 2*a)) - polylog(3, -I*c*e^(2*b*x + 2*a)))/(b^3*(2*I*c - 2)
```

```
))*b*(c + I) + 1/2*x^2*arccot((c + I)*tanh(b*x + a) + c)
```

Fricas [C] time = 2.17546, size = 720, normalized size = 6.37

$$\frac{2i b^3x^3 + 3i b^2x^2 \log\left(\frac{\left(ce^{(2bx+2a)}-i\right)e^{(-2bx-2a)}}{c+i}\right) + 2i a^3 - 6i bx\mathrm{Li}_2\left(\frac{1}{2}\sqrt{-4i c}e^{(bx+a)}\right) - 6i bx\mathrm{Li}_2\left(-\frac{1}{2}\sqrt{-4i c}e^{(bx+a)}\right) - 3i a^2 \log\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(2*I*b^3*x^3 + 3*I*b^2*x^2*log((c*e^(2*b*x + 2*a) - I)*e^(-2*b*x - 2*a
)/(c + I)) + 2*I*a^3 - 6*I*b*x*dilog(1/2*sqrt(-4*I*c)*e^(b*x + a)) - 6*I*b*
x*dilog(-1/2*sqrt(-4*I*c)*e^(b*x + a)) - 3*I*a^2*log(1/2*(2*c*e^(b*x + a) +
 I*sqrt(-4*I*c))/c) - 3*I*a^2*log(1/2*(2*c*e^(b*x + a) - I*sqrt(-4*I*c))/c)
 + (-3*I*b^2*x^2 + 3*I*a^2)*log(1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) + (-3*I*b
^2*x^2 + 3*I*a^2)*log(-1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) + 6*I*polylog(3, 1
/2*sqrt(-4*I*c)*e^(b*x + a)) + 6*I*polylog(3, -1/2*sqrt(-4*I*c)*e^(b*x + a)
))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+(I+c)*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left((c+i)\tanh\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot((c + I)*tanh(b*x + a) + c), x)
```

3.194 $\int \cot^{-1}(c + (i + c)\tanh(a + bx))\,dx$

Optimal. Leaf size=79

$$-\frac{i\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}-\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)+x\cot^{-1}(c+(c+i)\tanh(a+bx))+\frac{1}{2}ibx^2$$

```
[Out] (I/2)*b*x^2 + x*ArcCot[c + (I + c)*Tanh[a + b*x]] - (I/2)*x*Log[1 + I*c*E^(
2*a + 2*b*x)] - ((I/4)*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b
```

Rubi [A] time = 0.119533, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5188, 2184, 2190, 2279, 2391}

$$-\frac{i\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}-\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)+x\cot^{-1}(c+(c+i)\tanh(a+bx))+\frac{1}{2}ibx^2$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + (I + c)*Tanh[a + b*x]],x]
```

```
[Out] (I/2)*b*x^2 + x*ArcCot[c + (I + c)*Tanh[a + b*x]] - (I/2)*x*Log[1 + I*c*E^(
2*a + 2*b*x)] - ((I/4)*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b
```

Rule 5188

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*Arc
Cot[c + d*Tanh[a + b*x]], x] + Dist[b, Int[x/(c - d + c*E^(2*a + 2*b*x)), x
], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c - d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+(i+c)\tanh(a+bx))\,dx = x\cot^{-1}(c+(i+c)\tanh(a+bx)) + b\int \frac{x}{-i+ce^{2a+2bx}}\,dx$$
$$= \frac{1}{2}ibx^2 + x\cot^{-1}(c+(i+c)\tanh(a+bx)) - (ibc)\int \frac{e^{2a+2bx}x}{-i+ce^{2a+2bx}}\,dx$$
$$= \frac{1}{2}ibx^2 + x\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right) + \frac{1}{2}i\int \log\left(1\right.$$
$$= \frac{1}{2}ibx^2 + x\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right) + \frac{i\,\text{Subst}\left(\int \ldots\right.}{\ldots}$$
$$= \frac{1}{2}ibx^2 + x\cot^{-1}(c+(i+c)\tanh(a+bx)) - \frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right) - \frac{i\text{Li}_2\left(-ice^{2a+\ldots}\right.}{4b}$$

Mathematica [A] time = 0.792621, size = 71, normalized size = 0.9

$$x\cot^{-1}(c+(c+i)\tanh(a+bx)) - \frac{i\left(2bx\log\left(1-\frac{ie^{-2(a+bx)}}{c}\right) - \text{PolyLog}\left(2,\frac{ie^{-2(a+bx)}}{c}\right)\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[c + (I + c)*Tanh[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (I + c)*Tanh[a + b*x]] - ((I/4)*(2*b*x*Log[1 - I/(c*E^(2*(a +
b*x)))] - PolyLog[2, I/(c*E^(2*(a + b*x)))]))/b
```

Maple [B] time = 0.118, size = 1381, normalized size = 17.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+(I+c)*tanh(b*x+a)),x)

[Out] 1/4*I/(I+c)^2/b*ln(c-(I+c)*tanh(b*x+a)+I)*ln(-1/2*(-c-(I+c)*tanh(b*x+a)+I)/
c)*c^2-1/4*I/(I+c)^2/b*ln(c-(I+c)*tanh(b*x+a)+I)*ln((-c-(I+c)*tanh(b*x+a)-I
)/(-2*I-2*c))*c^2-1/4*I/(I+c)^2/b*ln(c+(I+c)*tanh(b*x+a)+I)*ln(-1/2*I*(-c-(
I+c)*tanh(b*x+a)+I))*c^2+1/4*I/(I+c)^2/b*ln(c+(I+c)*tanh(b*x+a)+I)*ln(-1/2*
I*(-c-(I+c)*tanh(b*x+a)+I))-1/4*I/(I+c)^2/b*ln(-1/2*I*(c+(I+c)*tanh(b*x+a)+
I))*ln(-1/2*I*(-c-(I+c)*tanh(b*x+a)+I))-1/4*I/(I+c)^2/b*ln(c-(I+c)*tanh(b*x
+a)+I)*ln(-1/2*(-c-(I+c)*tanh(b*x+a)+I)/c)+1/4*I/(I+c)^2/b*ln(c-(I+c)*tanh(
b*x+a)+I)*ln((-c-(I+c)*tanh(b*x+a)-I)/(-2*I-2*c))+1/4*I/(I+c)^2/b*dilog(-1/
2*I*(c+(I+c)*tanh(b*x+a)+I))*c^2+1/8*I/(I+c)^2/b*ln(c+(I+c)*tanh(b*x+a)+I)^
2*c^2-1/2/(I+c)^2/b*ln(c-(I+c)*tanh(b*x+a)+I)*ln(-1/2*(-c-(I+c)*tanh(b*x+a)
+I)/c)*c+1/2/(I+c)^2/b*ln(c-(I+c)*tanh(b*x+a)+I)*ln((-c-(I+c)*tanh(b*x+a)-I
)/(-2*I-2*c))*c-1/(I+c)/b*arccot(c+(I+c)*tanh(b*x+a))/(2*I+2*c)*ln(c+(I+c)*
tanh(b*x+a)+I)+1/(I+c)/b*arccot(c+(I+c)*tanh(b*x+a))/(2*I+2*c)*ln(c-(I+c)*t
anh(b*x+a)+I)+1/2/(I+c)^2/b*ln(c+(I+c)*tanh(b*x+a)+I)*ln(-1/2*I*(-c-(I+c)*t
anh(b*x+a)+I))*c+1/4*I/(I+c)^2/b*dilog(-1/2*(-c-(I+c)*tanh(b*x+a)+I)/c)*c^2
-1/4*I/(I+c)^2/b*dilog((-c-(I+c)*tanh(b*x+a)-I)/(-2*I-2*c))*c^2-1/8*I/(I+c)
^2/b*ln(c+(I+c)*tanh(b*x+a)+I)^2-1/4*I/(I+c)^2/b*dilog(-1/2*(-c-(I+c)*tanh(
b*x+a)+I)/c)+1/4*I/(I+c)^2/b*dilog((-c-(I+c)*tanh(b*x+a)-I)/(-2*I-2*c))-1/4
*I/(I+c)^2/b*dilog(-1/2*I*(c+(I+c)*tanh(b*x+a)+I))-1/2/(I+c)^2/b*dilog(-1/2
*(-c-(I+c)*tanh(b*x+a)+I)/c)*c+1/2/(I+c)^2/b*dilog((-c-(I+c)*tanh(b*x+a)-I)
/(-2*I-2*c))*c-1/2/(I+c)^2/b*dilog(-1/2*I*(c+(I+c)*tanh(b*x+a)+I))*c-1/4/(I
+c)^2/b*ln(c+(I+c)*tanh(b*x+a)+I)^2*c-1/2/(I+c)^2/b*ln(-1/2*I*(c+(I+c)*tanh
(b*x+a)+I))*ln(-1/2*I*(-c-(I+c)*tanh(b*x+a)+I))*c+1/4*I/(I+c)^2/b*ln(-1/2*I
*(c+(I+c)*tanh(b*x+a)+I))*ln(-1/2*I*(-c-(I+c)*tanh(b*x+a)+I))*c^2-1/(I+c)/b
*arccot(c+(I+c)*tanh(b*x+a))/(2*I+2*c)*ln(c-(I+c)*tanh(b*x+a)+I)*c^2+1/(I+c
)/b*arccot(c+(I+c)*tanh(b*x+a))/(2*I+2*c)*ln(c+(I+c)*tanh(b*x+a)+I)*c^2+2*I
/(I+c)/b*arccot(c+(I+c)*tanh(b*x+a))/(2*I+2*c)*ln(c+(I+c)*tanh(b*x+a)+I)*c-
2*I/(I+c)/b*arccot(c+(I+c)*tanh(b*x+a))/(2*I+2*c)*ln(c-(I+c)*tanh(b*x+a)+I)
*c
```

Maxima [A] time = 5.84948, size = 108, normalized size = 1.37

$$-2\,b(c+i)\left(\frac{2\,x^2}{2i\,c-2}-\frac{2\,bx\log\left(i\,ce^{(2\,bx+2\,a)}+1\right)+\mathrm{Li}_2\left(-i\,ce^{(2\,bx+2\,a)}\right)}{-2\,b^2(-i\,c+1)}\right)+x\,\mathrm{arccot}\left((c+i)\tanh\left(bx+a\right)+c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] -2*b*(c + I)*(2*x^2/(2*I*c - 2) - (2*b*x*log(I*c*e^(2*b*x + 2*a) + 1) + dil
og(-I*c*e^(2*b*x + 2*a)))/(b^2*(2*I*c - 2))) + x*arccot((c + I)*tanh(b*x +
a) + c)
```

Fricas [B] time = 2.23965, size = 520, normalized size = 6.58

$$\frac{i\,b^2x^2 + i\,bx\log\left(\frac{\left(ce^{(2\,bx+2\,a)}-i\right)e^{(-2\,bx-2\,a)}}{c+i}\right) - i\,a^2 + (-i\,bx - i\,a)\log\left(\frac{1}{2}\,\sqrt{-4i\,c}e^{(bx+a)} + 1\right) + (-i\,bx - i\,a)\log\left(-\frac{1}{2}\,\sqrt{-4i\,c}e^{(bx+a)} + \right.}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(I*b^2*x^2 + I*b*x*log((c*e^(2*b*x + 2*a) - I)*e^(-2*b*x - 2*a)/(c + I)
) - I*a^2 + (-I*b*x - I*a)*log(1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) + (-I*b*x
- I*a)*log(-1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) + I*a*log(1/2*(2*c*e^(b*x + a
) + I*sqrt(-4*I*c))/c) + I*a*log(1/2*(2*c*e^(b*x + a) - I*sqrt(-4*I*c))/c)
- I*dilog(1/2*sqrt(-4*I*c)*e^(b*x + a)) - I*dilog(-1/2*sqrt(-4*I*c)*e^(b*x
+ a)))/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$b\left(c^3 + 3ic^2 - 3c - i\right)\int \frac{x}{c^4e^{2a}e^{2bx} + 3ic^3e^{2a}e^{2bx} - ic^3 - 3c^2e^{2a}e^{2bx} + 3c^2 - ice^{2a}e^{2bx} + 3ic - 1}\,dx + \frac{ix\log\left(1 - \frac{}{c - \frac{c}{e^{2a}e^{2bx}+1} + \frac{}{e^{a}e^{b}}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+(I+c)*tanh(b*x+a)),x)
```

```
[Out] b*(c**3 + 3*I*c**2 - 3*c - I)*Integral(x/(c**4*exp(2*a)*exp(2*b*x) + 3*I*c*
*3*exp(2*a)*exp(2*b*x) - I*c**3 - 3*c**2*exp(2*a)*exp(2*b*x) + 3*c**2 - I*c
*exp(2*a)*exp(2*b*x) + 3*I*c - 1), x) + I*x*log(1 - I/(c - c/(exp(2*a)*exp(
2*b*x) + 1) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp(-b*x)) - I/(
```

```
exp(2*a)*exp(2*b*x) + 1) + I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp
(-b*x))))/2 - I*x*log(1 + I/(c - c/(exp(2*a)*exp(2*b*x) + 1) + c*exp(a)*exp
(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp(-b*x)) - I/(exp(2*a)*exp(2*b*x) + 1) +
 I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp(-b*x))))/2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}((c+i)\tanh(bx+a)+c)\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot((c + I)*tanh(b*x + a) + c), x)
```

3.195 $\int \frac{\cot^{-1}(c+(i+c)\tanh(a+bx))}{x}\,dx$

Optimal. Leaf size=21

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c+(c+i)\tanh(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + (I + c)*Tanh[a + b*x]]/x, x]
```

Rubi [A] time = 0.0930228, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c+(i+c)\tanh(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + (I + c)*Tanh[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + (I + c)*Tanh[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+(i+c)\tanh(a+bx))}{x}\,dx=\int \frac{\cot^{-1}(c+(i+c)\tanh(a+bx))}{x}\,dx$$

Mathematica [A] time = 3.18315, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+(i+c)\tanh(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + (I + c)*Tanh[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + (I + c)*Tanh[a + b*x]]/x, x]
```

Maple [A] time = 0.414, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c+(i+c)\tanh\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+(I+c)*tanh(b*x+a))/x,x)
```

```
[Out] int(arccot(c+(I+c)*tanh(b*x+a))/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-i\,bx-\frac{1}{4}\left(2\,\pi+4i\,a-2\,\arctan\left(1,c\right)+i\,\log\left(c^2+1\right)\right)\log\left(x\right)-\frac{1}{2}\int\frac{\arctan\left(1,-ce^{(2\,bx+2\,a)}\right)}{x}\,dx+\frac{1}{4}i\int\frac{\log\left(c^2e^{(4\,bx+4}\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*tanh(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] -I*b*x - 1/4*(2*pi + 4*I*a - 2*arctan2(1, c) + I*log(c^2 + 1))*log(x) - 1/2
*integrate(arctan2(1, -c*e^(2*b*x + 2*a))/x, x) + 1/4*I*integrate(log(c^2*e
^(4*b*x + 4*a) + 1)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{i\,\log\left(\frac{\left(ce^{(2\,bx+2\,a)}-i\right)e^{(-2\,bx-2\,a)}}{c+i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*tanh(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*I*log((c*e^(2*b*x + 2*a) - I)*e^(-2*b*x - 2*a)/(c + I))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+(I+c)*tanh(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left((c+i)\tanh\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*tanh(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot((c + I)*tanh(b*x + a) + c)/x, x)
```

3.196 $\int x^2 \cot^{-1}(c-(i-c)\tanh(a+bx))\,dx$

Optimal. Leaf size=145

$$-\frac{ix\text{PolyLog}\left(3,ice^{2a+2bx}\right)}{4b^2}+\frac{i\text{PolyLog}\left(4,ice^{2a+2bx}\right)}{8b^3}+\frac{ix^2\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)+\frac{1}{3}x^3\cot^{-}$$

```
[Out] (-I/12)*b*x^4 + (x^3*ArcCot[c - (I - c)*Tanh[a + b*x]])/3 + (I/6)*x^3*Log[1
 - I*c*E^(2*a + 2*b*x)] + ((I/4)*x^2*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b - (
(I/4)*x*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2 + ((I/8)*PolyLog[4, I*c*E^(2*a
 + 2*b*x)])/b^3
```

Rubi [A] time = 0.2268, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {5196, 2184, 2190, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3,ice^{2a+2bx}\right)}{4b^2}+\frac{i\text{PolyLog}\left(4,ice^{2a+2bx}\right)}{8b^3}+\frac{ix^2\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)+\frac{1}{3}x^3\cot^{-}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c - (I - c)*Tanh[a + b*x]],x]
```


```
[Out] (-I/12)*b*x^4 + (x^3*ArcCot[c - (I - c)*Tanh[a + b*x]])/3 + (I/6)*x^3*Log[1
 - I*c*E^(2*a + 2*b*x)] + ((I/4)*x^2*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b - (
(I/4)*x*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2 + ((I/8)*PolyLog[4, I*c*E^(2*a
 + 2*b*x)])/b^3
```


Rule 5196

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tanh[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d + c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c-(i-c)\tanh(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{3}b\int \frac{x^3}{i+ce^{2a+2bx}}\,dx$$

$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{3}(ibc)\int \frac{e^{2a+2bx}x^3}{i+ce^{2a+2bx}}\,dx$$

$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right) - \frac{1}{2}i$$

$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right) + \frac{ix}{}$$

$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right) + \frac{ix}{}$$

$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right) + \frac{ix}{}$$

$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right) + \frac{ix}{}$$

Mathematica [A] time = 0.183992, size = 128, normalized size = 0.88

$$\frac{i\left(-6b^2x^2\text{PolyLog}\left(2,-\frac{ie^{-2(a+bx)}}{c}\right)-6bx\text{PolyLog}\left(3,-\frac{ie^{-2(a+bx)}}{c}\right)-3\text{PolyLog}\left(4,-\frac{ie^{-2(a+bx)}}{c}\right)+4b^3x^3\log\left(1+\frac{ie^{-2(a+bx)}}{c}\right)\right)}{24b^3}+$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c - (I - c)*Tanh[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + (-I + c)*Tanh[a + b*x]])/3 + ((I/24)*(4*b^3*x^3*Log[1 + I/(
c*E^(2*(a + b*x)))] - 6*b^2*x^2*PolyLog[2, (-I)/(c*E^(2*(a + b*x)))] - 6*b*
x*PolyLog[3, (-I)/(c*E^(2*(a + b*x)))] - 3*PolyLog[4, (-I)/(c*E^(2*(a + b*x
)))]))/b^3
```

Maple [C] time = 15.757, size = 1570, normalized size = 10.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c-(I-c)*tanh(b*x+a)),x)
```

```
[Out] -1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))*csgn((2*ex
p(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)+
1))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^2-1/12*Pi*x^3*csgn(
I/(exp(2*b*x+2*a)+1))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(
2*b*x+2*a)+1))^2+1/3*Pi*x^3-1/12*Pi*x^3*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b
*x+2*a)*c)/(exp(2*b*x+2*a)+1))^3-1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)+1))*csg
n(I*(2*exp(2*b*x+2*a)*c+2*I))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*
a)+1))+1/12*I*b*c/(I-c)*x^4+1/4*I/b^3*c/(I-c)*a^4+1/8*I*polylog(4,I*c*exp(2
*b*x+2*a))/b^3+1/4*I*x^2*polylog(2,I*c*exp(2*b*x+2*a))/b+1/12*Pi*x^3*csgn(I
*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))*csgn((-2*I*ex
p(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))+1/12*Pi*x^3*csgn(I*(2*
exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^3+1/6*I*x^3*ln(2*I*exp(2*b*x+2*a)
-2*exp(2*b*x+2*a)*c)-1/12*Pi*x^3*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)
*c)/(exp(2*b*x+2*a)+1))^2-1/12*Pi*x^3*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*
b*x+2*a)+1))^3-1/12*Pi*x^3*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/
(exp(2*b*x+2*a)+1))^3-1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c+2*I))*csgn(I*(
2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^2+1/12*Pi*x^3*csgn(I*(-2*I*exp(
2*b*x+2*a)+2*exp(2*b*x+2*a)*c))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a
)*c)/(exp(2*b*x+2*a)+1))^2-1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp
(2*b*x+2*a)+1))*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^2+1/12*Pi
*x^3*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))*cs
gn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2-1/6*I/b^3
*a^3*ln(exp(2*b*x+2*a)*c+I)+1/3*I/b^2*c/(I-c)*x*a^3-1/3*I/b^3*c*a^3/(I-c)*l
n(exp(b*x+a))+1/6*I*x^3*ln(1-I*c*exp(2*b*x+2*a))+1/4/b^3/(I-c)*a^4+1/12*b/(
I-c)*x^4+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(-2*I*exp(2*b*x+2*a)
+2*exp(2*b*x+2*a)*c))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(
2*b*x+2*a)+1))-1/2*I/b^2*ln(1-I*c*exp(2*b*x+2*a))*x*a^2+1/2*I/b^2*a^2*ln(1-
I*exp(b*x+a)*(-I*c)^(1/2))*x+1/2*I/b^2*a^2*ln(1+I*exp(b*x+a)*(-I*c)^(1/2))*
x-1/12*Pi*x^3*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^2-1/6*I*x^3
*ln(-2*exp(2*b*x+2*a)*c-2*I)-1/4*I*x*polylog(3,I*c*exp(2*b*x+2*a))/b^2-1/3*
I/b^3*ln(1-I*c*exp(2*b*x+2*a))*a^3-1/4*I/b^3*polylog(2,I*c*exp(2*b*x+2*a))*
a^2+1/2*I/b^3*a^3*ln(1-I*exp(b*x+a)*(-I*c)^(1/2))+1/2*I/b^3*a^3*ln(1+I*exp(
b*x+a)*(-I*c)^(1/2))+1/2*I/b^3*a^2*dilog(1-I*exp(b*x+a)*(-I*c)^(1/2))+1/2*I
/b^3*a^2*dilog(1+I*exp(b*x+a)*(-I*c)^(1/2))-1/3/b^3*a^3/(I-c)*ln(exp(b*x+a)
)+1/3/b^2/(I-c)*x*a^3
```

Maxima [A] time = 5.87755, size = 174, normalized size = 1.2

$$\frac{1}{3}x^3\operatorname{arccot}\left((c-i)\tanh\left(bx+a\right)+c\right)+\frac{4}{9}\left(\frac{3x^4}{4ic+4}-\frac{4b^3x^3\log\left(-ice^{(2bx+2a)}+1\right)+6b^2x^2\mathrm{Li}_2\left(ice^{(2bx+2a)}\right)-6bx\mathrm{Li}_3(ic}{-2b^4(-ic-1)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot((c - I)*tanh(b*x + a) + c) + 4/9*(3*x^4/(4*I*c + 4) - (4*b^3
*x^3*log(-I*c*e^(2*b*x + 2*a) + 1) + 6*b^2*x^2*dilog(I*c*e^(2*b*x + 2*a)) -
 6*b*x*polylog(3, I*c*e^(2*b*x + 2*a)) + 3*polylog(4, I*c*e^(2*b*x + 2*a)))
/(b^4*(2*I*c + 2)))*b*(c - I)
```

Fricas [C] time = 2.2607, size = 853, normalized size = 5.88

$$\frac{-i\,b^4x^4 + 2i\,b^3x^3\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}+i}\right) + 6i\,b^2x^2\mathrm{Li}_2\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right) + 6i\,b^2x^2\mathrm{Li}_2\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right) + i\,a^4 - 2i\,a^3\log\left(\frac{2\,ce^{(bx+a)}\dots}{2\,c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(-I*b^4*x^4 + 2*I*b^3*x^3*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x + 2*
a) + I)) + 6*I*b^2*x^2*dilog(1/2*sqrt(4*I*c)*e^(b*x + a)) + 6*I*b^2*x^2*dil
og(-1/2*sqrt(4*I*c)*e^(b*x + a)) + I*a^4 - 2*I*a^3*log(1/2*(2*c*e^(b*x + a)
 + I*sqrt(4*I*c))/c) - 2*I*a^3*log(1/2*(2*c*e^(b*x + a) - I*sqrt(4*I*c))/c)
 - 12*I*b*x*polylog(3, 1/2*sqrt(4*I*c)*e^(b*x + a)) - 12*I*b*x*polylog(3, -
1/2*sqrt(4*I*c)*e^(b*x + a)) + (2*I*b^3*x^3 + 2*I*a^3)*log(1/2*sqrt(4*I*c)*
e^(b*x + a) + 1) + (2*I*b^3*x^3 + 2*I*a^3)*log(-1/2*sqrt(4*I*c)*e^(b*x + a)
 + 1) + 12*I*polylog(4, 1/2*sqrt(4*I*c)*e^(b*x + a)) + 12*I*polylog(4, -1/2
*sqrt(4*I*c)*e^(b*x + a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c-(I-c)*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}((c-i)\tanh(bx+a)+c)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot((c - I)*tanh(b*x + a) + c), x)
```

3.197 $\int x\cot^{-1}(c-(i-c)\tanh(a+bx))\,dx$

Optimal. Leaf size=116

$$-\frac{i\text{PolyLog}\left(3,ice^{2a+2bx}\right)}{8b^2}+\frac{ix\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(-c+i)\tanh(a+bx))\cdot$$

```
[Out] (-I/6)*b*x^3 + (x^2*ArcCot[c - (I - c)*Tanh[a + b*x]])/2 + (I/4)*x^2*Log[1
- I*c*E^(2*a + 2*b*x)] + ((I/4)*x*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b - ((I/
8)*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2
```

Rubi [A] time = 0.194392, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5196, 2184, 2190, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,ice^{2a+2bx}\right)}{8b^2}+\frac{ix\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(-c+i)\tanh(a+bx))\cdot$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c - (I - c)*Tanh[a + b*x]],x]
```

```
[Out] (-I/6)*b*x^3 + (x^2*ArcCot[c - (I - c)*Tanh[a + b*x]])/2 + (I/4)*x^2*Log[1
- I*c*E^(2*a + 2*b*x)] + ((I/4)*x*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b - ((I/
8)*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2
```

Rule 5196

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Tanh[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d + c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c-(i-c)\tanh(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{2}b\int \frac{x^2}{i+ce^{2a+2bx}}\,dx$$
$$= -\frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{2}(ibc)\int \frac{e^{2a+2bx}x^2}{i+ce^{2a+2bx}}\,dx$$
$$= -\frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) - \frac{1}{2}i\int$$
$$= -\frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) + \frac{ix\mathrm{Li}}{}$$
$$= -\frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) + \frac{ix\mathrm{Li}}{}$$
$$= -\frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c-(i-c)\tanh(a+bx)) + \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) + \frac{ix\mathrm{Li}}{}$$

Mathematica [A] time = 0.0978775, size = 102, normalized size = 0.88

$$\frac{i\left(-2bx\mathrm{PolyLog}\left(2,-\frac{ie^{-2(a+bx)}}{c}\right)-\mathrm{PolyLog}\left(3,-\frac{ie^{-2(a+bx)}}{c}\right)+2b^2x^2\log\left(1+\frac{ie^{-2(a+bx)}}{c}\right)\right)}{8b^2}+\frac{1}{2}x^2\cot^{-1}(c+(c-i)\tanh(a+b$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c - (I - c)*Tanh[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (-I + c)*Tanh[a + b*x]])/2 + ((I/8)*(2*b^2*x^2*Log[1 + I/(c
*E^(2*(a + b*x)))] - 2*b*x*PolyLog[2, (-I)/(c*E^(2*(a + b*x)))] - PolyLog[3
, (-I)/(c*E^(2*(a + b*x)))]))/b^2
```

Maple [C] time = 5.872, size = 1534, normalized size = 13.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c-(I-c)*tanh(b*x+a)),x)
```

```
[Out] 1/2*Pi*x^2-1/3/b^2/(I-c)*a^3+1/6*b*x^3/(I-c)-1/2/b/(I-c)*x*a^2-1/8*Pi*x^2*c
sgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^3-1/8*Pi*x^2*csgn((2*exp(2
*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))^2-1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)+1)
```

```
)*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2+1/4
*I/b^2*a^2*ln(exp(2*b*x+2*a)*c+I)+1/4*I*x*polylog(2,I*c*exp(2*b*x+2*a))/b+1
/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1
))*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2-1/8*
Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c+2*I))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(ex
p(2*b*x+2*a)+1))^2+1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*
a)+1))^3-1/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*
b*x+2*a)+1))^3+1/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c))*
csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^2-1/8*P
i*x^2*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))*csgn((2*exp(2*b*x
+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))-1/8*I*polylog(3,I*c*exp(2*b*x+2*a))/b^2-1/
3*I/b^2*c/(I-c)*a^3+1/6*I*b*c/(I-c)*x^3-1/2*I/b*c/(I-c)*x*a^2+1/2*I/b^2*c*a
^2/(I-c)*ln(exp(b*x+a))-1/2*I/b^2*a*dilog(1-I*exp(b*x+a)*(-I*c)^(1/2))+1/4*
I/b^2*ln(1-I*c*exp(2*b*x+2*a))*a^2+1/4*I/b^2*polylog(2,I*c*exp(2*b*x+2*a))*
a-1/2*I/b^2*a^2*ln(1-I*exp(b*x+a)*(-I*c)^(1/2))-1/2*I/b^2*a^2*ln(1+I*exp(b*
x+a)*(-I*c)^(1/2))-1/2*I/b^2*a*dilog(1+I*exp(b*x+a)*(-I*c)^(1/2))+1/4*I*x^2
*ln(1-I*c*exp(2*b*x+2*a))+1/4*I*x^2*ln(2*I*exp(2*b*x+2*a)-2*exp(2*b*x+2*a)*
c)-1/4*I*x^2*ln(-2*exp(2*b*x+2*a)*c-2*I)-1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)+
1))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2
*b*x+2*a)+1))+1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(-2*I*exp(2*b*x+
2*a)+2*exp(2*b*x+2*a)*c))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(
exp(2*b*x+2*a)+1))+1/2*I/b*ln(1-I*c*exp(2*b*x+2*a))*x*a-1/2*I/b*a*ln(1-I*ex
p(b*x+a)*(-I*c)^(1/2))*x-1/2*I/b*a*ln(1+I*exp(b*x+a)*(-I*c)^(1/2))*x-1/8*Pi
*x^2*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^3-1/
8*Pi*x^2*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)+1))^
2+1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)+1))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(ex
p(2*b*x+2*a)+1))^2+1/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*
c)/(exp(2*b*x+2*a)+1))*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2
*b*x+2*a)+1))+1/2/b^2*a^2/(I-c)*ln(exp(b*x+a))-1/8*Pi*x^2*csgn(I*(2*exp(2*b
*x+2*a)*c+2*I)/(exp(2*b*x+2*a)+1))*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x
+2*a)+1))^2
```

Maxima [A] time = 5.81669, size = 143, normalized size = 1.23

$$\left(\frac{2\,x^3}{3i\,c+3}-\frac{2\,b^2x^2\log\left(-i\,ce^{(2\,bx+2\,a)}+1\right)+2\,bx\mathrm{Li}_2\left(i\,ce^{(2\,bx+2\,a)}\right)-\mathrm{Li}_3(i\,ce^{(2\,bx+2\,a)})}{-2\,b^3(-i\,c-1)}\right)b(c-i)+\frac{1}{2}\,x^2\,\mathrm{arccot}\,((c-i)\tanh\,(bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] (2*x^3/(3*I*c + 3) - (2*b^2*x^2*log(-I*c*e^(2*b*x + 2*a) + 1) + 2*b*x*dilog
```

```
(I*c*e^(2*b*x + 2*a)) - polylog(3, I*c*e^(2*b*x + 2*a)))/(b^3*(2*I*c + 2)))
*b*(c - I) + 1/2*x^2*arccot((c - I)*tanh(b*x + a) + c)
```

Fricas [C] time = 2.14237, size = 706, normalized size = 6.09

$$\frac{-2i\,b^3x^3 + 3i\,b^2x^2\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}+i}\right) - 2i\,a^3 + 6i\,bx\mathrm{Li}_2\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right) + 6i\,bx\mathrm{Li}_2\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right) + 3i\,a^2\log\left(\frac{2\,ce^{(bx+a)}+i}{2\,c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(-2*I*b^3*x^3 + 3*I*b^2*x^2*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x +
2*a) + I)) - 2*I*a^3 + 6*I*b*x*dilog(1/2*sqrt(4*I*c)*e^(b*x + a)) + 6*I*b*x
*dilog(-1/2*sqrt(4*I*c)*e^(b*x + a)) + 3*I*a^2*log(1/2*(2*c*e^(b*x + a) + I
*sqrt(4*I*c))/c) + 3*I*a^2*log(1/2*(2*c*e^(b*x + a) - I*sqrt(4*I*c))/c) + (
3*I*b^2*x^2 - 3*I*a^2)*log(1/2*sqrt(4*I*c)*e^(b*x + a) + 1) + (3*I*b^2*x^2
- 3*I*a^2)*log(-1/2*sqrt(4*I*c)*e^(b*x + a) + 1) - 6*I*polylog(3, 1/2*sqrt(
4*I*c)*e^(b*x + a)) - 6*I*polylog(3, -1/2*sqrt(4*I*c)*e^(b*x + a)))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c-(I-c)*tanh(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left((c-i)\tanh\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot((c - I)*tanh(b*x + a) + c), x)
```

3.198 $\int \cot^{-1}(c-(i-c)\tanh(a+bx))\,dx$

Optimal. Leaf size=82

$$\frac{i\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}+\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+x\cot^{-1}(c-(-c+i)\tanh(a+bx))-\frac{1}{2}ibx^2$$

```
[Out] (-I/2)*b*x^2 + x*ArcCot[c - (I - c)*Tanh[a + b*x]] + (I/2)*x*Log[1 - I*c*E^
(2*a + 2*b*x)] + ((I/4)*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b
```

Rubi [A] time = 0.118658, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {5188, 2184, 2190, 2279, 2391}

$$\frac{i\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}+\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+x\cot^{-1}(c-(-c+i)\tanh(a+bx))-\frac{1}{2}ibx^2$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c - (I - c)*Tanh[a + b*x]],x]
```

```
[Out] (-I/2)*b*x^2 + x*ArcCot[c - (I - c)*Tanh[a + b*x]] + (I/2)*x*Log[1 - I*c*E^
(2*a + 2*b*x)] + ((I/4)*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b
```

Rule 5188

```
Int[ArcCot[(c_.) + (d_.)*Tanh[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*Arc
Cot[c + d*Tanh[a + b*x]], x] + Dist[b, Int[x/(c - d + c*E^(2*a + 2*b*x)), x
], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c - d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \cot^{-1}(c-(i-c)\tanh(a+bx))\,dx &= x\cot^{-1}(c-(i-c)\tanh(a+bx))+b\int \frac{x}{i+ce^{2a+2bx}}\,dx\\
&= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\tanh(a+bx))+(ibc)\int \frac{e^{2a+2bx}x}{i+ce^{2a+2bx}}\,dx\\
&= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\tanh(a+bx))+\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)-\frac{1}{2}i\int \log\left(1\right.\\
&= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\tanh(a+bx))+\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)-\frac{i\,\mathrm{Subst}\left(\int\right.}{}\\
&= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\tanh(a+bx))+\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+\frac{i\mathrm{Li}_2\left(ice^{2a+\right.}{4b}
\end{aligned}$$

Mathematica [A] time = 0.71074, size = 71, normalized size = 0.87

$$\frac{i\left(2bx\log\left(1+\frac{ie^{-2(a+bx)}}{c}\right)-\mathrm{PolyLog}\left(2,-\frac{ie^{-2(a+bx)}}{c}\right)\right)}{4b}+x\cot^{-1}(c+(c-i)\tanh(a+bx))$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[c - (I - c)*Tanh[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (-I + c)*Tanh[a + b*x]] + ((I/4)*(2*b*x*Log[1 + I/(c*E^(2*(a +
 b*x)))] - PolyLog[2, (-I)/(c*E^(2*(a + b*x)))]))/b
```

Maple [B] time = 0.116, size = 1351, normalized size = 16.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c-(I-c)*tanh(b*x+a)),x)
```

```
[Out] 1/4*I/b/(c-I)/(I-c)*dilog(-1/2*I*((c-I)*tanh(b*x+a)+c+I))-1/b/(c-I)*arccot(
(c-I)*tanh(b*x+a)+c)/(2*I-2*c)*ln((c-I)*tanh(b*x+a)-c+I)-1/2/b/(c-I)/(I-c)*
dilog(-1/2*I*((c-I)*tanh(b*x+a)+c+I))*c+1/4/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x
+a)+c-I)^2*c-1/2/b/(c-I)/(I-c)*dilog(((c-I)*tanh(b*x+a)+c-I)/(-2*I+2*c))*c+
1/2/b/(c-I)/(I-c)*dilog(1/2*((c-I)*tanh(b*x+a)+c+I)/c)*c+1/b/(c-I)*arccot((
c-I)*tanh(b*x+a)+c)/(2*I-2*c)*ln((c-I)*tanh(b*x+a)+c-I)-1/8*I/b/(c-I)/(I-c)
*ln((c-I)*tanh(b*x+a)+c-I)^2+1/4*I/b/(c-I)/(I-c)*dilog(((c-I)*tanh(b*x+a)+c
-I)/(-2*I+2*c))-1/4*I/b/(c-I)/(I-c)*dilog(1/2*((c-I)*tanh(b*x+a)+c+I)/c)-1/
b/(c-I)*arccot((c-I)*tanh(b*x+a)+c)/(2*I-2*c)*ln((c-I)*tanh(b*x+a)+c-I)*c^2
-1/2/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)-c+I)*ln(((c-I)*tanh(b*x+a)+c-I)/(-2
*I+2*c))*c+1/2/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)-c+I)*ln(1/2*((c-I)*tanh(b
*x+a)+c+I)/c)*c-1/4*I/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)-c+I)*ln(1/2*((c-I)
*tanh(b*x+a)+c+I)/c)-1/2/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)+c-I)*ln(-1/2*I*
((c-I)*tanh(b*x+a)+c+I))*c+1/b/(c-I)*arccot((c-I)*tanh(b*x+a)+c)/(2*I-2*c)*
ln((c-I)*tanh(b*x+a)-c+I)*c^2-1/4*I/b/(c-I)/(I-c)*dilog(-1/2*I*((c-I)*tanh(
b*x+a)+c+I))*c^2+1/8*I/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)+c-I)^2*c^2-1/4*I/
b/(c-I)/(I-c)*dilog(((c-I)*tanh(b*x+a)+c-I)/(-2*I+2*c))*c^2+1/4*I/b/(c-I)/(
I-c)*dilog(1/2*((c-I)*tanh(b*x+a)+c+I)/c)*c^2+1/4*I/b/(c-I)/(I-c)*ln((c-I)*
tanh(b*x+a)-c+I)*ln(((c-I)*tanh(b*x+a)+c-I)/(-2*I+2*c))+1/4*I/b/(c-I)/(I-c)
*ln((c-I)*tanh(b*x+a)+c-I)*ln(-1/2*I*((c-I)*tanh(b*x+a)+c+I))+2*I/b/(c-I)*a
rccot((c-I)*tanh(b*x+a)+c)/(2*I-2*c)*ln((c-I)*tanh(b*x+a)+c-I)*c-1/4*I/b/(c
-I)/(I-c)*ln((c-I)*tanh(b*x+a)+c-I)*ln(-1/2*I*((c-I)*tanh(b*x+a)+c+I))*c^2-
1/4*I/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)-c+I)*ln(((c-I)*tanh(b*x+a)+c-I)/(-
2*I+2*c))*c^2+1/4*I/b/(c-I)/(I-c)*ln((c-I)*tanh(b*x+a)-c+I)*ln(1/2*((c-I)*t
anh(b*x+a)+c+I)/c)*c^2-2*I/b/(c-I)*arccot((c-I)*tanh(b*x+a)+c)/(2*I-2*c)*ln
((c-I)*tanh(b*x+a)-c+I)*c
```

Maxima [A] time = 5.77346, size = 108, normalized size = 1.32

$$2\,b(c-i)\left(\frac{2\,x^2}{2i\,c+2}-\frac{2\,bx\log\left(-i\,ce^{(2\,bx+2\,a)}+1\right)+\mathrm{Li}_2\left(i\,ce^{(2\,bx+2\,a)}\right)}{-2\,b^2(-i\,c-1)}\right)+x\,\mathrm{arccot}\left((c-i)\tanh\left(bx+a\right)+c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="maxima")
```

```
[Out] 2*b*(c - I)*(2*x^2/(2*I*c + 2) - (2*b*x*log(-I*c*e^(2*b*x + 2*a) + 1) + dil
og(I*c*e^(2*b*x + 2*a)))/(b^2*(2*I*c + 2))) + x*arccot((c - I)*tanh(b*x + a
) + c)
```

Fricas [B] time = 2.24632, size = 509, normalized size = 6.21

$$\frac{-i\,b^2x^2 + i\,bx\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}+i}\right) + i\,a^2 + (i\,bx + i\,a)\log\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)} + 1\right) + (i\,bx + i\,a)\log\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)} + 1\right) - i\,a\log\left(\right.}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(-I*b^2*x^2 + I*b*x*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x + 2*a) + I)
) + I*a^2 + (I*b*x + I*a)*log(1/2*sqrt(4*I*c)*e^(b*x + a) + 1) + (I*b*x + I
*a)*log(-1/2*sqrt(4*I*c)*e^(b*x + a) + 1) - I*a*log(1/2*(2*c*e^(b*x + a) +
I*sqrt(4*I*c))/c) - I*a*log(1/2*(2*c*e^(b*x + a) - I*sqrt(4*I*c))/c) + I*di
log(1/2*sqrt(4*I*c)*e^(b*x + a)) + I*dilog(-1/2*sqrt(4*I*c)*e^(b*x + a)))/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$b\left(c^6 - 6ic^5 - 15c^4 + 20ic^3 + 15c^2 - 6ic - 1\right)\int \frac{x}{c^7e^{2a}e^{2bx} - 6ic^6e^{2a}e^{2bx} + ic^6 - 15c^5e^{2a}e^{2bx} + 6c^5 + 20ic^4e^{2a}e^{2bx} - 15ic^4 + 15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c-(I-c)*tanh(b*x+a)),x)
```

```
[Out] b*(c**6 - 6*I*c**5 - 15*c**4 + 20*I*c**3 + 15*c**2 - 6*I*c - 1)*Integral(x/
(c**7*exp(2*a)*exp(2*b*x) - 6*I*c**6*exp(2*a)*exp(2*b*x) + I*c**6 - 15*c**5
*exp(2*a)*exp(2*b*x) + 6*c**5 + 20*I*c**4*exp(2*a)*exp(2*b*x) - 15*I*c**4 +
 15*c**3*exp(2*a)*exp(2*b*x) - 20*c**3 - 6*I*c**2*exp(2*a)*exp(2*b*x) + 15*
I*c**2 - c*exp(2*a)*exp(2*b*x) + 6*c - I), x) + I*x*log(1 - I/(c - c/(exp(2
*a)*exp(2*b*x) + 1) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp(-b*x
)) + I/(exp(2*a)*exp(2*b*x) + 1) - I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp
```

```
(-a)*exp(-b*x))))/2 - (I*c*x + x)*log(1 + I/(c - c/(exp(2*a)*exp(2*b*x) + 1
) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp(-b*x)) + I/(exp(2*a)*e
xp(2*b*x) + 1) - I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) + exp(-a)*exp(-b*x))))/
(2*c - 2*I)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}((c-i)\tanh(bx+a)+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*tanh(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot((c - I)*tanh(b*x + a) + c), x)
```

3.199 $\int \frac{\cot^{-1}(c-(i-c)\tanh(a+bx))}{x}\,dx$

Optimal. Leaf size=24

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c-(-c+i)\tanh(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c - (I - c)*Tanh[a + b*x]]/x, x]
```

Rubi [A] time = 0.0894306, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c-(i-c)\tanh(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c - (I - c)*Tanh[a + b*x]]/x,x]

[Out] Defer[Int][ArcCot[c - (I - c)*Tanh[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c-(i-c)\tanh(a+bx))}{x}\,dx=\int \frac{\cot^{-1}(c-(i-c)\tanh(a+bx))}{x}\,dx$$

Mathematica [A] time = 3.21579, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c-(i-c)\tanh(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c - (I - c)*Tanh[a + b*x]]/x,x]

[Out] Integrate[ArcCot[c - (I - c)*Tanh[a + b*x]]/x, x]
```

Maple [A] time = 0.446, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c-(i-c)\tanh\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c-(I-c)*tanh(b*x+a))/x,x)
```

```
[Out] int(arccot(c-(I-c)*tanh(b*x+a))/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$i\,bx + \frac{1}{4}\left(2\,\pi + 4i\,a - 2\,\arctan\left(1,-c\right) + i\,\log\left(c^2+1\right)\right)\log\left(x\right) + \frac{1}{2}\int \frac{\arctan\left(1, ce^{(2\,bx+2\,a)}\right)}{x}\,dx - \frac{1}{4}i\int \frac{\log\left(c^2e^{(4\,bx+4\,a)}\right.}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*tanh(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] I*b*x + 1/4*(2*pi + 4*I*a - 2*arctan2(1, -c) + I*log(c^2 + 1))*log(x) + 1/2
*integrate(arctan2(1, c*e^(2*b*x + 2*a))/x, x) - 1/4*I*integrate(log(c^2*e^
(4*b*x + 4*a) + 1)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{i\,\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}+i}\right)}{2\,x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*tanh(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*I*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x + 2*a) + I))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c-(I-c)*tanh(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left((c-i)\tanh\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*tanh(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot((c - I)*tanh(b*x + a) + c)/x, x)
```

3.200 $\int (e+fx)^3 \cot^{-1}(\coth(a+bx))\,dx$

Optimal. Leaf size=299

$$\frac{3if^2(e+fx)\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}-\frac{3if^2(e+fx)\text{PolyLog}\left(4,ie^{2a+2bx}\right)}{8b^3}-\frac{3if(e+fx)^2\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}+\frac{3if(e}{}$$

```
[Out] ((e + f*x)^4*ArcCot[Coth[a + b*x]])/(4*f) - ((e + f*x)^4*ArcTan[E^(2*a + 2*
b*x)])/(4*f) + ((I/4)*(e + f*x)^3*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b - ((I
/4)*(e + f*x)^3*PolyLog[2, I*E^(2*a + 2*b*x)])/b - (((3*I)/8)*f*(e + f*x)^2
*PolyLog[3, (-I)*E^(2*a + 2*b*x)])/b^2 + (((3*I)/8)*f*(e + f*x)^2*PolyLog[3
, I*E^(2*a + 2*b*x)])/b^2 + (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, (-I)*E^(2*a
 + 2*b*x)])/b^3 - (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, I*E^(2*a + 2*b*x)])/b
^3 - (((3*I)/16)*f^3*PolyLog[5, (-I)*E^(2*a + 2*b*x)])/b^4 + (((3*I)/16)*f^
3*PolyLog[5, I*E^(2*a + 2*b*x)])/b^4
```

Rubi [A] time = 0.208478, antiderivative size = 299, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5186, 4180, 2531, 6609, 2282, 6589}

$$\frac{3if^2(e+fx)\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}-\frac{3if^2(e+fx)\text{PolyLog}\left(4,ie^{2a+2bx}\right)}{8b^3}-\frac{3if(e+fx)^2\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}+\frac{3if(e}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^3*ArcCot[Coth[a + b*x]],x]
```


```
[Out] ((e + f*x)^4*ArcCot[Coth[a + b*x]])/(4*f) - ((e + f*x)^4*ArcTan[E^(2*a + 2*
b*x)])/(4*f) + ((I/4)*(e + f*x)^3*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b - ((I
/4)*(e + f*x)^3*PolyLog[2, I*E^(2*a + 2*b*x)])/b - (((3*I)/8)*f*(e + f*x)^2
*PolyLog[3, (-I)*E^(2*a + 2*b*x)])/b^2 + (((3*I)/8)*f*(e + f*x)^2*PolyLog[3
, I*E^(2*a + 2*b*x)])/b^2 + (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, (-I)*E^(2*a
 + 2*b*x)])/b^3 - (((3*I)/8)*f^2*(e + f*x)*PolyLog[4, I*E^(2*a + 2*b*x)])/b
^3 - (((3*I)/16)*f^3*PolyLog[5, (-I)*E^(2*a + 2*b*x)])/b^4 + (((3*I)/16)*f^
3*PolyLog[5, I*E^(2*a + 2*b*x)])/b^4
```


Rule 5186

```
Int[ArcCot[Coth[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.), x_Symbol]
:> Simp[((e + f*x)^(m + 1)*ArcCot[Coth[a + b*x]])/(f*(m + 1)), x] - Dist[b/
(f*(m + 1)), Int[(e + f*x)^(m + 1)*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b
```

```
, e, f}, x] && IGtQ[m, 0]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int (e+fx)^3\cot^{-1}(\coth(a+bx))\,dx = \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{b\int (e+fx)^4\mathbf{sech}(2a+2bx)\,dx}{4f}$$
$$= \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f} + \frac{1}{2}i\int (e+fx)^3\log\left(1\right.$$
$$= \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f} + \frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f} + \frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f} + \frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f} + \frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^4\cot^{-1}(\coth(a+bx))}{4f} - \frac{(e+fx)^4\tan^{-1}\left(e^{2a+2bx}\right)}{4f} + \frac{i(e+fx)^3\mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$

<u>Mathematica</u> [B] time = 0.336366, size = 600, normalized size = 2.01

$$\frac{1}{4}x\left(6e^2fx+4e^3+4ef^2x^2+f^3x^3\right)\cot^{-1}(\coth(a+bx)) - \frac{i\left(6b^2e^2f\text{PolyLog}\left(3,-ie^{2(a+bx)}\right)-6b^2e^2f\text{PolyLog}\left(3,ie^{2(a+bx}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^3*ArcCot[Coth[a + b*x]],x]
```

```
[Out] (x*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3)*ArcCot[Coth[a + b*x]])/4 - (
(I/16)*(8*b^4*e^3*x*Log[1 - I*E^(2*(a + b*x))] + 12*b^4*e^2*f*x^2*Log[1 - I
*E^(2*(a + b*x))] + 8*b^4*e*f^2*x^3*Log[1 - I*E^(2*(a + b*x))] + 2*b^4*f^3*
x^4*Log[1 - I*E^(2*(a + b*x))] - 8*b^4*e^3*x*Log[1 + I*E^(2*(a + b*x))] - 1
2*b^4*e^2*f*x^2*Log[1 + I*E^(2*(a + b*x))] - 8*b^4*e*f^2*x^3*Log[1 + I*E^(2
*(a + b*x))] - 2*b^4*f^3*x^4*Log[1 + I*E^(2*(a + b*x))] - 4*b^3*(e + f*x)^3
*PolyLog[2, (-I)*E^(2*(a + b*x))] + 4*b^3*(e + f*x)^3*PolyLog[2, I*E^(2*(a
+ b*x))] + 6*b^2*e^2*f*PolyLog[3, (-I)*E^(2*(a + b*x))] + 12*b^2*e*f^2*x*Po
lyLog[3, (-I)*E^(2*(a + b*x))] + 6*b^2*f^3*x^2*PolyLog[3, (-I)*E^(2*(a + b*
x))] - 6*b^2*e^2*f*PolyLog[3, I*E^(2*(a + b*x))] - 12*b^2*e*f^2*x*PolyLog[3
, I*E^(2*(a + b*x))] - 6*b^2*f^3*x^2*PolyLog[3, I*E^(2*(a + b*x))] - 6*b*e*
f^2*PolyLog[4, (-I)*E^(2*(a + b*x))] - 6*b*f^3*x*PolyLog[4, (-I)*E^(2*(a +
b*x))] + 6*b*e*f^2*PolyLog[4, I*E^(2*(a + b*x))] + 6*b*f^3*x*PolyLog[4, I*E
^(2*(a + b*x))] + 3*f^3*PolyLog[5, (-I)*E^(2*(a + b*x))] - 3*f^3*PolyLog[5,
```

```
I*E^(2*(a + b*x))]))/b^4
```

Maple [C] time = 7.395, size = 7275, normalized size = 24.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^3*arccot(coth(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\left(f^3x^4+4\,ef^2x^3+6\,e^2fx^2+4\,e^3x\right)\arctan\left(\frac{e^{(2\,bx+2\,a)}-1}{e^{(2\,bx+2\,a)}+1}\right)-\int\frac{\left(bf^3x^4e^{(2\,a)}+4\,bef^2x^3e^{(2\,a)}+6\,be^2fx^2e^{(2\,a)}+4\,be^3xe^{(2\,a}}{2\left(e^{(4\,bx+4\,a)}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*arccot(coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/4*(f^3*x^4 + 4*e*f^2*x^3 + 6*e^2*f*x^2 + 4*e^3*x)*arctan((e^(2*b*x + 2*a)
 - 1)/(e^(2*b*x + 2*a) + 1)) - integrate(1/2*(b*f^3*x^4*e^(2*a) + 4*b*e*f^2
*x^3*e^(2*a) + 6*b*e^2*f*x^2*e^(2*a) + 4*b*e^3*x*e^(2*a))*e^(2*b*x)/(e^(4*b
*x + 4*a) + 1), x)
```

Fricas [C] time = 3.03046, size = 4070, normalized size = 13.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*arccot(coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/8*(24*I*f^3*polylog(5, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2
4*I*f^3*polylog(5, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 24*I*f
```

```
^3*polylog(5, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 24*I*f^3*po
lylog(5, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*(b^4*f^3*x^4
+ 4*b^4*e*f^2*x^3 + 6*b^4*e^2*f*x^2 + 4*b^4*e^3*x)*arctan(sinh(b*x + a)/cos
h(b*x + a)) + (-4*I*b^3*f^3*x^3 - 12*I*b^3*e*f^2*x^2 - 12*I*b^3*e^2*f*x - 4
*I*b^3*e^3)*dilog(1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-4*I*b^
3*f^3*x^3 - 12*I*b^3*e*f^2*x^2 - 12*I*b^3*e^2*f*x - 4*I*b^3*e^3)*dilog(-1/2
*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (4*I*b^3*f^3*x^3 + 12*I*b^3*e
*f^2*x^2 + 12*I*b^3*e^2*f*x + 4*I*b^3*e^3)*dilog(1/2*sqrt(-4*I)*(cosh(b*x +
 a) + sinh(b*x + a))) + (4*I*b^3*f^3*x^3 + 12*I*b^3*e*f^2*x^2 + 12*I*b^3*e^
2*f*x + 4*I*b^3*e^3)*dilog(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)))
 + (-I*b^4*f^3*x^4 - 4*I*b^4*e*f^2*x^3 - 6*I*b^4*e^2*f*x^2 - 4*I*b^4*e^3*x
- 4*I*a*b^3*e^3 + 6*I*a^2*b^2*e^2*f - 4*I*a^3*b*e*f^2 + I*a^4*f^3)*log(1/2*
sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^4*f^3*x^4 - 4*I*b^4*
e*f^2*x^3 - 6*I*b^4*e^2*f*x^2 - 4*I*b^4*e^3*x - 4*I*a*b^3*e^3 + 6*I*a^2*b^2
*e^2*f - 4*I*a^3*b*e*f^2 + I*a^4*f^3)*log(-1/2*sqrt(4*I)*(cosh(b*x + a) + s
inh(b*x + a)) + 1) + (I*b^4*f^3*x^4 + 4*I*b^4*e*f^2*x^3 + 6*I*b^4*e^2*f*x^2
 + 4*I*b^4*e^3*x + 4*I*a*b^3*e^3 - 6*I*a^2*b^2*e^2*f + 4*I*a^3*b*e*f^2 - I*
a^4*f^3)*log(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^4*f
^3*x^4 + 4*I*b^4*e*f^2*x^3 + 6*I*b^4*e^2*f*x^2 + 4*I*b^4*e^3*x + 4*I*a*b^3*
e^3 - 6*I*a^2*b^2*e^2*f + 4*I*a^3*b*e*f^2 - I*a^4*f^3)*log(-1/2*sqrt(-4*I)*
(cosh(b*x + a) + sinh(b*x + a)) + 1) + (4*I*a*b^3*e^3 - 6*I*a^2*b^2*e^2*f +
 4*I*a^3*b*e*f^2 - I*a^4*f^3)*log(I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*
x + a)) + (4*I*a*b^3*e^3 - 6*I*a^2*b^2*e^2*f + 4*I*a^3*b*e*f^2 - I*a^4*f^3)
*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (-4*I*a*b^3*e^3 +
6*I*a^2*b^2*e^2*f - 4*I*a^3*b*e*f^2 + I*a^4*f^3)*log(I*sqrt(-4*I) + 2*cosh(
b*x + a) + 2*sinh(b*x + a)) + (-4*I*a*b^3*e^3 + 6*I*a^2*b^2*e^2*f - 4*I*a^3
*b*e*f^2 + I*a^4*f^3)*log(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)
) + (-24*I*b*f^3*x - 24*I*b*e*f^2)*polylog(4, 1/2*sqrt(4*I)*(cosh(b*x + a)
+ sinh(b*x + a))) + (-24*I*b*f^3*x - 24*I*b*e*f^2)*polylog(4, -1/2*sqrt(4*I
)*(cosh(b*x + a) + sinh(b*x + a))) + (24*I*b*f^3*x + 24*I*b*e*f^2)*polylog(
4, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (24*I*b*f^3*x + 24*I*b
*e*f^2)*polylog(4, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (12*I
*b^2*f^3*x^2 + 24*I*b^2*e*f^2*x + 12*I*b^2*e^2*f)*polylog(3, 1/2*sqrt(4*I)*
(cosh(b*x + a) + sinh(b*x + a))) + (12*I*b^2*f^3*x^2 + 24*I*b^2*e*f^2*x + 1
2*I*b^2*e^2*f)*polylog(3, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) +
 (-12*I*b^2*f^3*x^2 - 24*I*b^2*e*f^2*x - 12*I*b^2*e^2*f)*polylog(3, 1/2*sqr
t(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-12*I*b^2*f^3*x^2 - 24*I*b^2*e*
f^2*x - 12*I*b^2*e^2*f)*polylog(3, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*
x + a))))/b^4
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**3*acot(coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (fx+e)^3 \operatorname{arccot}(\coth(bx+a)) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^3*arccot(coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^3*arccot(coth(b*x + a)), x)
```

3.201 $\int (e+fx)^2 \cot^{-1}(\coth(a+bx))\,dx$

Optimal. Leaf size=229

$$-\frac{if(e+fx)\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{4b^2}+\frac{if(e+fx)\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{4b^2}+\frac{if^2\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}-\frac{if^2\text{PolyLog}\left(4,i\right.}{8b^3}$$

```
[Out] ((e + f*x)^3*ArcCot[Coth[a + b*x]])/(3*f) - ((e + f*x)^3*ArcTan[E^(2*a + 2*
b*x)])/(3*f) + ((I/4)*(e + f*x)^2*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b - ((I
/4)*(e + f*x)^2*PolyLog[2, I*E^(2*a + 2*b*x)])/b - ((I/4)*f*(e + f*x)*PolyL
og[3, (-I)*E^(2*a + 2*b*x)])/b^2 + ((I/4)*f*(e + f*x)*PolyLog[3, I*E^(2*a +
 2*b*x)])/b^2 + ((I/8)*f^2*PolyLog[4, (-I)*E^(2*a + 2*b*x)])/b^3 - ((I/8)*f
^2*PolyLog[4, I*E^(2*a + 2*b*x)])/b^3
```

Rubi [A] time = 0.153689, antiderivative size = 229, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5186, 4180, 2531, 6609, 2282, 6589}

$$-\frac{if(e+fx)\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{4b^2}+\frac{if(e+fx)\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{4b^2}+\frac{if^2\text{PolyLog}\left(4,-ie^{2a+2bx}\right)}{8b^3}-\frac{if^2\text{PolyLog}\left(4,i\right.}{8b^3}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)^2*ArcCot[Coth[a + b*x]],x]
```


```
[Out] ((e + f*x)^3*ArcCot[Coth[a + b*x]])/(3*f) - ((e + f*x)^3*ArcTan[E^(2*a + 2*
b*x)])/(3*f) + ((I/4)*(e + f*x)^2*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b - ((I
/4)*(e + f*x)^2*PolyLog[2, I*E^(2*a + 2*b*x)])/b - ((I/4)*f*(e + f*x)*PolyL
og[3, (-I)*E^(2*a + 2*b*x)])/b^2 + ((I/4)*f*(e + f*x)*PolyLog[3, I*E^(2*a +
 2*b*x)])/b^2 + ((I/8)*f^2*PolyLog[4, (-I)*E^(2*a + 2*b*x)])/b^3 - ((I/8)*f
^2*PolyLog[4, I*E^(2*a + 2*b*x)])/b^3
```


Rule 5186

```
Int[ArcCot[Coth[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.), x_Symbol]
:> Simp[((e + f*x)^(m + 1)*ArcCot[Coth[a + b*x]])/(f*(m + 1)), x] - Dist[b/
(f*(m + 1)), Int[(e + f*x)^(m + 1)*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b
, e, f}, x] && IGtQ[m, 0]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int (e+fx)^2 \cot^{-1}(\coth(a+bx))\,dx = \frac{(e+fx)^3 \cot^{-1}(\coth(a+bx))}{3f} - \frac{b\int (e+fx)^3 \mathbf{sech}(2a+2bx)\,dx}{3f}$$
$$= \frac{(e+fx)^3 \cot^{-1}(\coth(a+bx))}{3f} - \frac{(e+fx)^3 \tan^{-1}\left(e^{2a+2bx}\right)}{3f} + \frac{1}{2}i\int (e+fx)^2 \log\left(1\right.$$
$$= \frac{(e+fx)^3 \cot^{-1}(\coth(a+bx))}{3f} - \frac{(e+fx)^3 \tan^{-1}\left(e^{2a+2bx}\right)}{3f} + \frac{i(e+fx)^2 \mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^3 \cot^{-1}(\coth(a+bx))}{3f} - \frac{(e+fx)^3 \tan^{-1}\left(e^{2a+2bx}\right)}{3f} + \frac{i(e+fx)^2 \mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^3 \cot^{-1}(\coth(a+bx))}{3f} - \frac{(e+fx)^3 \tan^{-1}\left(e^{2a+2bx}\right)}{3f} + \frac{i(e+fx)^2 \mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$
$$= \frac{(e+fx)^3 \cot^{-1}(\coth(a+bx))}{3f} - \frac{(e+fx)^3 \tan^{-1}\left(e^{2a+2bx}\right)}{3f} + \frac{i(e+fx)^2 \mathbf{Li}_2\left(-ie^{2a}\right.}{4b}$$

Mathematica [A] time = 0.201568, size = 375, normalized size = 1.64

$$\frac{1}{3}x\left(3e^2+3efx+f^2x^2\right)\cot^{-1}(\coth(a+bx)) - \frac{i\left(-6b^2(e+fx)^2\text{PolyLog}\left(2,-ie^{2(a+bx)}\right)+6b^2(e+fx)^2\text{PolyLog}\left(2,ie^{2(a\right.\right.}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)^2*ArcCot[Coth[a + b*x]],x]
```

```
[Out] (x*(3*e^2 + 3*e*f*x + f^2*x^2)*ArcCot[Coth[a + b*x]])/3 - ((I/24)*(12*b^3*e
^2*x*Log[1 - I*E^(2*(a + b*x))] + 12*b^3*e*f*x^2*Log[1 - I*E^(2*(a + b*x))]
 + 4*b^3*f^2*x^3*Log[1 - I*E^(2*(a + b*x))] - 12*b^3*e^2*x*Log[1 + I*E^(2*(
a + b*x))] - 12*b^3*e*f*x^2*Log[1 + I*E^(2*(a + b*x))] - 4*b^3*f^2*x^3*Log[
1 + I*E^(2*(a + b*x))] - 6*b^2*(e + f*x)^2*PolyLog[2, (-I)*E^(2*(a + b*x))]
 + 6*b^2*(e + f*x)^2*PolyLog[2, I*E^(2*(a + b*x))] + 6*b*e*f*PolyLog[3, (-I
)*E^(2*(a + b*x))] + 6*b*f^2*x*PolyLog[3, (-I)*E^(2*(a + b*x))] - 6*b*e*f*P
olyLog[3, I*E^(2*(a + b*x))] - 6*b*f^2*x*PolyLog[3, I*E^(2*(a + b*x))] - 3*
f^2*PolyLog[4, (-I)*E^(2*(a + b*x))] + 3*f^2*PolyLog[4, I*E^(2*(a + b*x))])
)/b^3
```

Maple [C] time = 9.65, size = 5425, normalized size = 23.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)^2*arccot(coth(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\left(f^2x^3+3\,efx^2+3\,e^2x\right)\arctan\left(\frac{e^{(2\,bx+2\,a)}-1}{e^{(2\,bx+2\,a)}+1}\right)-\int\frac{2\left(bf^2x^3e^{(2\,a)}+3\,befx^2e^{(2\,a)}+3\,be^2xe^{(2\,a)}\right)e^{(2\,bx)}}{3\left(e^{(4\,bx+4\,a)}+1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*arccot(coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*(f^2*x^3 + 3*e*f*x^2 + 3*e^2*x)*arctan((e^(2*b*x + 2*a) - 1)/(e^(2*b*x
+ 2*a) + 1)) - integrate(2/3*(b*f^2*x^3*e^(2*a) + 3*b*e*f*x^2*e^(2*a) + 3*b
*e^2*x*e^(2*a))*e^(2*b*x)/(e^(4*b*x + 4*a) + 1), x)
```

Fricas [C] time = 2.58532, size = 2903, normalized size = 12.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*arccot(coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/6*(-6*I*f^2*polylog(4, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 6
*I*f^2*polylog(4, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 6*I*f^2
*polylog(4, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 6*I*f^2*polyl
og(4, -1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*(b^3*f^2*x^3 + 3
*b^3*e*f*x^2 + 3*b^3*e^2*x)*arctan(sinh(b*x + a)/cosh(b*x + a)) + (-3*I*b^2
*f^2*x^2 - 6*I*b^2*e*f*x - 3*I*b^2*e^2)*dilog(1/2*sqrt(4*I)*(cosh(b*x + a)
+ sinh(b*x + a))) + (-3*I*b^2*f^2*x^2 - 6*I*b^2*e*f*x - 3*I*b^2*e^2)*dilog(
-1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (3*I*b^2*f^2*x^2 + 6*I*b^
2*e*f*x + 3*I*b^2*e^2)*dilog(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))
) + (3*I*b^2*f^2*x^2 + 6*I*b^2*e*f*x + 3*I*b^2*e^2)*dilog(-1/2*sqrt(-4*I)*(
cosh(b*x + a) + sinh(b*x + a))) + (-I*b^3*f^2*x^3 - 3*I*b^3*e*f*x^2 - 3*I*b
^3*e^2*x - 3*I*a*b^2*e^2 + 3*I*a^2*b*e*f - I*a^3*f^2)*log(1/2*sqrt(4*I)*(co
```

```
sh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^3*f^2*x^3 - 3*I*b^3*e*f*x^2 - 3*I
*b^3*e^2*x - 3*I*a*b^2*e^2 + 3*I*a^2*b*e*f - I*a^3*f^2)*log(-1/2*sqrt(4*I)*
(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^3*f^2*x^3 + 3*I*b^3*e*f*x^2 + 3
*I*b^3*e^2*x + 3*I*a*b^2*e^2 - 3*I*a^2*b*e*f + I*a^3*f^2)*log(1/2*sqrt(-4*I
)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^3*f^2*x^3 + 3*I*b^3*e*f*x^2 +
 3*I*b^3*e^2*x + 3*I*a*b^2*e^2 - 3*I*a^2*b*e*f + I*a^3*f^2)*log(-1/2*sqrt(-
4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (3*I*a*b^2*e^2 - 3*I*a^2*b*e*f
+ I*a^3*f^2)*log(I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (3*I*a*
b^2*e^2 - 3*I*a^2*b*e*f + I*a^3*f^2)*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2
*sinh(b*x + a)) + (-3*I*a*b^2*e^2 + 3*I*a^2*b*e*f - I*a^3*f^2)*log(I*sqrt(-
4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (-3*I*a*b^2*e^2 + 3*I*a^2*b*e*f
 - I*a^3*f^2)*log(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (6*I
*b*f^2*x + 6*I*b*e*f)*polylog(3, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x +
a))) + (6*I*b*f^2*x + 6*I*b*e*f)*polylog(3, -1/2*sqrt(4*I)*(cosh(b*x + a) +
 sinh(b*x + a))) + (-6*I*b*f^2*x - 6*I*b*e*f)*polylog(3, 1/2*sqrt(-4*I)*(co
sh(b*x + a) + sinh(b*x + a))) + (-6*I*b*f^2*x - 6*I*b*e*f)*polylog(3, -1/2*
sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))))/b^3
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(e+fx\right)^2 \operatorname{acot}\left(\coth\left(a+bx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*acot(coth(b*x+a)),x)
```

```
[Out] Integral((e + f*x)**2*acot(coth(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx+e\right)^2 \operatorname{arccot}\left(\coth\left(bx+a\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)^2*arccot(coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)^2*arccot(coth(b*x + a)), x)
```

3.202 $\int (e+fx)\cot^{-1}(\coth(a+bx))\,dx$

Optimal. Leaf size=159

$$-\frac{if\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}+\frac{if\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{8b^2}+\frac{i(e+fx)\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}-\frac{i(e+fx)\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}$$

```
[Out] ((e + f*x)^2*ArcCot[Coth[a + b*x]])/(2*f) - ((e + f*x)^2*ArcTan[E^(2*a + 2*
b*x)])/(2*f) + ((I/4)*(e + f*x)*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b - ((I/4
)*(e + f*x)*PolyLog[2, I*E^(2*a + 2*b*x)])/b - ((I/8)*f*PolyLog[3, (-I)*E^(
2*a + 2*b*x)])/b^2 + ((I/8)*f*PolyLog[3, I*E^(2*a + 2*b*x)])/b^2
```

Rubi [A] time = 0.0989876, antiderivative size = 159, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {5186, 4180, 2531, 2282, 6589}

$$-\frac{if\text{PolyLog}\left(3,-ie^{2a+2bx}\right)}{8b^2}+\frac{if\text{PolyLog}\left(3,ie^{2a+2bx}\right)}{8b^2}+\frac{i(e+fx)\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}-\frac{i(e+fx)\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[(e + f*x)*ArcCot[Coth[a + b*x]],x]
```


```
[Out] ((e + f*x)^2*ArcCot[Coth[a + b*x]])/(2*f) - ((e + f*x)^2*ArcTan[E^(2*a + 2*
b*x)])/(2*f) + ((I/4)*(e + f*x)*PolyLog[2, (-I)*E^(2*a + 2*b*x)])/b - ((I/4
)*(e + f*x)*PolyLog[2, I*E^(2*a + 2*b*x)])/b - ((I/8)*f*PolyLog[3, (-I)*E^(
2*a + 2*b*x)])/b^2 + ((I/8)*f*PolyLog[3, I*E^(2*a + 2*b*x)])/b^2
```


Rule 5186

```
Int[ArcCot[Coth[(a_.) + (b_.)*(x_)]]*((e_.) + (f_.)*(x_))^(m_.), x_Symbol]
:> Simp[((e + f*x)^(m + 1)*ArcCot[Coth[a + b*x]])/(f*(m + 1)), x] - Dist[b/
(f*(m + 1)), Int[(e + f*x)^(m + 1)*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b
, e, f}, x] && IGtQ[m, 0]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
```

```
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int (e+fx)\cot^{-1}(\coth(a+bx))\,dx = \frac{(e+fx)^2\cot^{-1}(\coth(a+bx))}{2f} - \frac{b\int (e+fx)^2\mathbf{sech}(2a+2bx)\,dx}{2f}$$

$$= \frac{(e+fx)^2\cot^{-1}(\coth(a+bx))}{2f} - \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} + \frac{1}{2}i\int (e+fx)\log\left(1 -\right.$$

$$= \frac{(e+fx)^2\cot^{-1}(\coth(a+bx))}{2f} - \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} + \frac{i(e+fx)\mathbf{Li}_2\left(-ie^{2a+2b}\right.}{4b}$$

$$= \frac{(e+fx)^2\cot^{-1}(\coth(a+bx))}{2f} - \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} + \frac{i(e+fx)\mathbf{Li}_2\left(-ie^{2a+2b}\right.}{4b}$$

$$= \frac{(e+fx)^2\cot^{-1}(\coth(a+bx))}{2f} - \frac{(e+fx)^2\tan^{-1}\left(e^{2a+2bx}\right)}{2f} + \frac{i(e+fx)\mathbf{Li}_2\left(-ie^{2a+2b}\right.}{4b}$$

Mathematica [A] time = 0.244567, size = 278, normalized size = 1.75

$$-\frac{if\left(-2bx\text{PolyLog}\left(2,-ie^{2(a+bx)}\right)+2bx\text{PolyLog}\left(2,ie^{2(a+bx)}\right)+\text{PolyLog}\left(3,-ie^{2(a+bx)}\right)-\text{PolyLog}\left(3,ie^{2(a+bx)}\right)+2b^2x^2\right.}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e + f*x)*ArcCot[Coth[a + b*x]],x]
```

```
[Out] e*x*ArcCot[Coth[a + b*x]] + (f*x^2*ArcCot[Coth[a + b*x]])/2 - (e*(-(((-4*I)
*a + Pi - (4*I)*b*x)*(Log[1 - I*E^(2*(a + b*x))] - Log[1 + I*E^(2*(a + b*x)
)])) + ((-4*I)*a + Pi)*Log[Cot[((4*I)*a + Pi + (4*I)*b*x)/4]] - (2*I)*(Poly
Log[2, (-I)*E^(2*(a + b*x))] - PolyLog[2, I*E^(2*(a + b*x))])))/(8*b) - ((I
/8)*f*(2*b^2*x^2*Log[1 - I*E^(2*(a + b*x))] - 2*b^2*x^2*Log[1 + I*E^(2*(a +
 b*x))] - 2*b*x*PolyLog[2, (-I)*E^(2*(a + b*x))] + 2*b*x*PolyLog[2, I*E^(2*
(a + b*x))] + PolyLog[3, (-I)*E^(2*(a + b*x))] - PolyLog[3, I*E^(2*(a + b*x
))]))/b^2
```

Maple [C] time = 8.72, size = 2688, normalized size = 16.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*arccot(coth(b*x+a)),x)
```

```
[Out] 1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))*csgn((1-I)*(exp(2*
b*x+2*a)+I)/(exp(2*b*x+2*a)-1))-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2
*b*x+2*a)-1))*csgn((1+I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))-1/4*Pi*x*e*
csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2-
1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))*csgn((1-I)*(exp(2*
b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2+1/4*Pi*x*e*csgn((1+I)*(exp(2*b*x+2*a)-I)/
(exp(2*b*x+2*a)-1))^2+1/8*Pi*x^2*f*csgn((1+I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x
+2*a)-1))^2-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))^3+1/4*
Pi*x*e*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^3-1/4*Pi*x*e*csgn((1-I
)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^3-1/4*Pi*x*e*csgn((1+I)*(exp(2*b*x
+2*a)-I)/(exp(2*b*x+2*a)-1))^3+1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*a)+I)/(exp(
2*b*x+2*a)-1))*csgn((1-I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))+1/4*Pi*x*e
*csgn((1-I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2-1/8*Pi*x^2*f*csgn(I*(e
xp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))*csgn((1+I)*(exp(2*b*x+2*a)-I)/(exp(2*b
*x+2*a)-1))+1/2*I*(1/2*f*x^2+e*x)*ln(exp(2*b*x+2*a)+I)+1/8*Pi*x^2*f*csgn(I*
```

(exp(2*b*x+2*a)-I))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))^2-1/4*I/b
^2*f*a^2*ln(exp(2*b*x+2*a)+I)+1/2*I/b*a*e*ln(exp(2*b*x+2*a)+I)-1/2*I*e/b*a*
ln(-exp(2*b*x+2*a)+I)+1/8*I*f*polylog(3,I*exp(2*b*x+2*a))/b^2-1/4*I*ln(exp(
2*b*x+2*a)-I)*f*x^2-1/2*I*ln(exp(2*b*x+2*a)-I)*e*x-1/8*Pi*x^2*f*csgn(I*(exp
(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))*csgn((1-I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x
+2*a)-1))^2+1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I*(exp(2*b*x+2*a)-I)
/(exp(2*b*x+2*a)-1))^2+1/8*Pi*f*x^2+1/4*Pi*e*x-1/8*Pi*x^2*f*csgn(I*(exp(2*b
*x+2*a)+I))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2-1/4*I*f*ln(1-I*
exp(2*b*x+2*a))*x^2-1/2*I*ln(((-I)^(1/2)-exp(b*x+a))/(-I)^(1/2))*x*e-1/2*I*
ln(((-I)^(1/2)+exp(b*x+a))/(-I)^(1/2))*x*e+1/4*I*f*ln(1+I*exp(2*b*x+2*a))*x
^2+1/2*I*e*ln(1+exp(b*x+a)*(-1)^(3/4))*x+1/2*I*e*ln(1-exp(b*x+a)*(-1)^(3/4)
)*x-1/2*I/b*e*dilog(((-I)^(1/2)-exp(b*x+a))/(-I)^(1/2))-1/2*I/b*e*dilog(((-
I)^(1/2)+exp(b*x+a))/(-I)^(1/2))+1/2*I*e/b*dilog(1+exp(b*x+a)*(-1)^(3/4))+1
/2*I*e/b*dilog(1-exp(b*x+a)*(-1)^(3/4))-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)+I
))*csgn(I*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2+1/4*Pi*x*e*csgn(I/(exp(2
*b*x+2*a)-1))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))^2+1/4*I*f/b^2*a
^2*ln(-exp(2*b*x+2*a)+I)+1/4*I*f/b*polylog(2,-I*exp(2*b*x+2*a))*x+1/4*I*f/b
^2*polylog(2,-I*exp(2*b*x+2*a))*a+1/2*I*e/b*ln(1+exp(b*x+a)*(-1)^(3/4))*a+1
/2*I*e/b*ln(1-exp(b*x+a)*(-1)^(3/4))*a-1/2*I*f/b^2*a^2*ln(1+exp(b*x+a)*(-1)
^(3/4))-1/2*I*f/b^2*a^2*ln(1-exp(b*x+a)*(-1)^(3/4))+1/2*I/b^2*f*a*dilog(((-
I)^(1/2)-exp(b*x+a))/(-I)^(1/2))+1/2*I/b^2*f*a*dilog(((-I)^(1/2)+exp(b*x+a)
)/(-I)^(1/2))-1/2*I*f/b^2*a*dilog(1+exp(b*x+a)*(-1)^(3/4))-1/2*I*f/b^2*a*di
log(1-exp(b*x+a)*(-1)^(3/4))-1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I
/(exp(2*b*x+2*a)-1))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))+1/8*Pi*x
^2*f*csgn(I*(exp(2*b*x+2*a)+I))*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(exp(2*b*
x+2*a)+I)/(exp(2*b*x+2*a)-1))-1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I))*csgn(I/
(exp(2*b*x+2*a)-1))*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))+1/8*Pi*x^
2*f*csgn((1-I)*(exp(2*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2-1/8*Pi*x^2*f*csgn(I
*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))^3+1/8*Pi*x^2*f*csgn(I*(exp(2*b*x+2*
a)+I)/(exp(2*b*x+2*a)-1))^3-1/8*Pi*x^2*f*csgn((1-I)*(exp(2*b*x+2*a)+I)/(exp
(2*b*x+2*a)-1))^3-1/8*Pi*x^2*f*csgn((1+I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a
)-1))^3-1/4*I/b^2*f*polylog(2,I*exp(2*b*x+2*a))*a+1/2*I/b^2*f*a^2*ln(((-I)^
(1/2)-exp(b*x+a))/(-I)^(1/2))-1/4*I/b*f*polylog(2,I*exp(2*b*x+2*a))*x+1/4*I
*f/b^2*ln(1+I*exp(2*b*x+2*a))*a^2+1/2*I/b^2*f*a^2*ln(((-I)^(1/2)+exp(b*x+a)
)/(-I)^(1/2))+1/4*Pi*x*e*csgn(I*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))*csgn
((1+I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*a)-1))^2+1/8*Pi*x^2*f*csgn(I*(exp(2*
b*x+2*a)-I)/(exp(2*b*x+2*a)-1))*csgn((1+I)*(exp(2*b*x+2*a)-I)/(exp(2*b*x+2*
a)-1))^2+1/8*Pi*x^2*f*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(exp(2*b*x+2*a)-I)/
(exp(2*b*x+2*a)-1))^2-1/8*Pi*x^2*f*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(exp(2
*b*x+2*a)+I)/(exp(2*b*x+2*a)-1))^2-1/8*I*f*polylog(3,-I*exp(2*b*x+2*a))/b^2
-1/2*I/b*ln(((-I)^(1/2)-exp(b*x+a))/(-I)^(1/2))*a*e-1/2*I/b*ln(((-I)^(1/2)+
exp(b*x+a))/(-I)^(1/2))*a*e-1/4*I/b^2*f*ln(1-I*exp(2*b*x+2*a))*a^2+1/4*Pi*x
*e*csgn(I*(exp(2*b*x+2*a)+I))*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(exp(2*b*x+
2*a)+I)/(exp(2*b*x+2*a)-1))+1/2*I/b*f*a*ln(((-I)^(1/2)-exp(b*x+a))/(-I)^(1/
2))*x+1/2*I*f/b*ln(1+I*exp(2*b*x+2*a))*x*a-1/2*I*f/b*a*ln(1+exp(b*x+a)*(-1)

```
^(3/4))*x+1/2*I/b*f*a*ln(((-I)^(1/2)+exp(b*x+a))/(-I)^(1/2))*x-1/2*I*f/b*a*
ln(1-exp(b*x+a)*(-1)^(3/4))*x-1/2*I/b*f*ln(1-I*exp(2*b*x+2*a))*x*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\left(fx^2+2\,ex\right)\arctan\left(\frac{e^{(2\,bx+2\,a)}-1}{e^{(2\,bx+2\,a)}+1}\right)-\int\frac{\left(bfx^2e^{(2\,a)}+2\,bexe^{(2\,a)}\right)e^{(2\,bx)}}{e^{(4\,bx+4\,a)}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*arccot(coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*(f*x^2 + 2*e*x)*arctan((e^(2*b*x + 2*a) - 1)/(e^(2*b*x + 2*a) + 1)) - i
ntegrate((b*f*x^2*e^(2*a) + 2*b*e*x*e^(2*a))*e^(2*b*x)/(e^(4*b*x + 4*a) + 1
), x)
```

Fricas [C] time = 2.37412, size = 1894, normalized size = 11.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*arccot(coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b^2*f*x^2 + 2*b^2*e*x)*arctan(sinh(b*x + a)/cosh(b*x + a)) + (-2*I*
b*f*x - 2*I*b*e)*dilog(1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + (-2
*I*b*f*x - 2*I*b*e)*dilog(-1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) +
 (2*I*b*f*x + 2*I*b*e)*dilog(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))
) + (2*I*b*f*x + 2*I*b*e)*dilog(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x +
 a))) + (-I*b^2*f*x^2 - 2*I*b^2*e*x - 2*I*a*b*e + I*a^2*f)*log(1/2*sqrt(4*I
)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^2*f*x^2 - 2*I*b^2*e*x - 2*I*
a*b*e + I*a^2*f)*log(-1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) +
(I*b^2*f*x^2 + 2*I*b^2*e*x + 2*I*a*b*e - I*a^2*f)*log(1/2*sqrt(-4*I)*(cosh(
b*x + a) + sinh(b*x + a)) + 1) + (I*b^2*f*x^2 + 2*I*b^2*e*x + 2*I*a*b*e - I
*a^2*f)*log(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (2*I*a*b
*e - I*a^2*f)*log(I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (2*I*a
*b*e - I*a^2*f)*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) + (-2
*I*a*b*e + I*a^2*f)*log(I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) +
 (-2*I*a*b*e + I*a^2*f)*log(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x +
a)) + 2*I*f*polylog(3, 1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) + 2*I
```

```
*f*polylog(3, -1/2*sqrt(4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 2*I*f*polyl
og(3, 1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))) - 2*I*f*polylog(3, -1
/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))))/b^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(e+fx\right) \operatorname{acot}\left(\coth\left(a+bx\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*acot(coth(b*x+a)),x)
```

```
[Out] Integral((e + f*x)*acot(coth(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx+e\right) \operatorname{arccot}\left(\coth\left(bx+a\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*arccot(coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate((f*x + e)*arccot(coth(b*x + a)), x)
```

3.203 $\int \cot^{-1}(\coth(a+bx))\,dx$

Optimal. Leaf size=74

$$\frac{i\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}-\frac{i\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}-x\tan^{-1}\left(e^{2a+2bx}\right)+x\cot^{-1}(\coth(a+bx))$$

```
[Out] x*ArcCot[Coth[a + b*x]] - x*ArcTan[E^(2*a + 2*b*x)] + ((I/4)*PolyLog[2, (-I
)*E^(2*a + 2*b*x)])/b - ((I/4)*PolyLog[2, I*E^(2*a + 2*b*x)])/b
```

Rubi [A] time = 0.0429558, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 7, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5182, 4180, 2279, 2391}

$$\frac{i\text{PolyLog}\left(2,-ie^{2a+2bx}\right)}{4b}-\frac{i\text{PolyLog}\left(2,ie^{2a+2bx}\right)}{4b}-x\tan^{-1}\left(e^{2a+2bx}\right)+x\cot^{-1}(\coth(a+bx))$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[Coth[a + b*x]],x]
```

```
[Out] x*ArcCot[Coth[a + b*x]] - x*ArcTan[E^(2*a + 2*b*x)] + ((I/4)*PolyLog[2, (-I
)*E^(2*a + 2*b*x)])/b - ((I/4)*PolyLog[2, I*E^(2*a + 2*b*x)])/b
```

Rule 5182

```
Int[ArcCot[Coth[(a_.) + (b_.)*(x_)]], x_Symbol] :> Simp[x*ArcCot[Coth[a + b
*x]], x] - Dist[b, Int[x*Sech[2*a + 2*b*x], x], x] /; FreeQ[{a, b}, x]
```

Rule 4180

```
Int[csc[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_.)*(x_)]*((c_.) + (d_.)*(x_
))^(m_.), x_Symbol] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(-(I*e) + f*fz*x)/E^(
I*k*Pi)])/(f*fz*I), x] + (-Dist[(d*m)/(f*fz*I), Int[(c + d*x)^(m - 1)*Log[1
 - E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x] + Dist[(d*m)/(f*fz*I), Int[(c +
d*x)^(m - 1)*Log[1 + E^(-(I*e) + f*fz*x)/E^(I*k*Pi)], x], x]) /; FreeQ[{c,
d, e, f, fz}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
```

```
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(\coth(a+bx))\,dx = x\cot^{-1}(\coth(a+bx)) - b\int x\mathrm{sech}(2a+2bx)\,dx$$
$$= x\cot^{-1}(\coth(a+bx)) - x\tan^{-1}\left(e^{2a+2bx}\right) + \frac{1}{2}i\int \log\left(1-ie^{2a+2bx}\right)dx - \frac{1}{2}i\int \log\left(1+ie^{2a\ldots}\right.$$
$$= x\cot^{-1}(\coth(a+bx)) - x\tan^{-1}\left(e^{2a+2bx}\right) + \frac{i\,\mathrm{Subst}\left(\int \frac{\log(1-ix)}{x}\,dx, x, e^{2a+2bx}\right)}{4b} - \frac{i\,\mathrm{Subst}\left(\int\ldots\right.}{\ldots}$$
$$= x\cot^{-1}(\coth(a+bx)) - x\tan^{-1}\left(e^{2a+2bx}\right) + \frac{i\mathrm{Li}_2\left(-ie^{2a+2bx}\right)}{4b} - \frac{i\mathrm{Li}_2\left(ie^{2a+2bx}\right)}{4b}$$

Mathematica [A] time = 0.0409286, size = 132, normalized size = 1.78

$$x\cot^{-1}(\coth(a+bx)) - \frac{-2i\left(\mathrm{PolyLog}\left(2,-ie^{2(a+bx)}\right)-\mathrm{PolyLog}\left(2,ie^{2(a+bx)}\right)\right)-(-4ia-4ibx+\pi)\left(\log\left(1-ie^{2(a+bx)}\right)-\ldots\right.}{8b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[Coth[a + b*x]],x]
```

```
[Out] x*ArcCot[Coth[a + b*x]] - (-(((-4*I)*a + Pi - (4*I)*b*x)*(Log[1 - I*E^(2*(a
 + b*x))] - Log[1 + I*E^(2*(a + b*x))])) + ((-4*I)*a + Pi)*Log[Cot[((4*I)*a
 + Pi + (4*I)*b*x)/4]] - (2*I)*(PolyLog[2, (-I)*E^(2*(a + b*x))] - PolyLog[
2, I*E^(2*(a + b*x))]))/(8*b)
```

Maple [B] time = 0.143, size = 196, normalized size = 2.7

$$\frac{\mathrm{Artanh}(\coth(bx+a))\,\mathrm{arccot}(\coth(bx+a))}{b} + \frac{\arctan(\coth(bx+a))\,\mathrm{Artanh}(\coth(bx+a))}{b} + \frac{\arctan(\coth(bx+\ldots}{2b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(coth(b*x+a)),x)
```

```
[Out] 1/b*arctanh(coth(b*x+a))*arccot(coth(b*x+a))+1/b*arctan(coth(b*x+a))*arctan
h(coth(b*x+a))+1/2/b*arctan(coth(b*x+a))*ln(1+I*(1+I*coth(b*x+a))^2/(coth(b
*x+a)^2+1))-1/4*I/b*polylog(2,-I*(1+I*coth(b*x+a))^2/(coth(b*x+a)^2+1))-1/2
/b*arctan(coth(b*x+a))*ln(1-I*(1+I*coth(b*x+a))^2/(coth(b*x+a)^2+1))+1/4*I/
b*polylog(2,I*(1+I*coth(b*x+a))^2/(coth(b*x+a)^2+1))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$x\arctan\left(\frac{e^{(2\,bx+2\,a)}-1}{e^{(2\,bx+2\,a)}+1}\right)-2\,b\int\frac{xe^{(2\,bx+2\,a)}}{e^{(4\,bx+4\,a)}+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] x*arctan((e^(2*b*x + 2*a) - 1)/(e^(2*b*x + 2*a) + 1)) - 2*b*integrate(x*e^(
2*b*x + 2*a)/(e^(4*b*x + 4*a) + 1), x)
```

Fricas [B] time = 2.01077, size = 1098, normalized size = 14.84

$$2\,bx\arctan\left(\frac{\sinh(bx+a)}{\cosh(bx+a)}\right)+(-i\,bx-i\,a)\log\left(\frac{1}{2}\sqrt{4i}(\cosh(bx+a)+\sinh(bx+a))+1\right)+(-i\,bx-i\,a)\log\left(-\frac{1}{2}\sqrt{4i}(\cosh(bx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x*arctan(sinh(b*x + a)/cosh(b*x + a)) + (-I*b*x - I*a)*log(1/2*sqr
t(4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b*x - I*a)*log(-1/2*sqrt(
4*I)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b*x + I*a)*log(1/2*sqrt(-4*I
)*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b*x + I*a)*log(-1/2*sqrt(-4*I)*
(cosh(b*x + a) + sinh(b*x + a)) + 1) + I*a*log(I*sqrt(4*I) + 2*cosh(b*x + a
) + 2*sinh(b*x + a)) + I*a*log(-I*sqrt(4*I) + 2*cosh(b*x + a) + 2*sinh(b*x
+ a)) - I*a*log(I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) - I*a*log
(-I*sqrt(-4*I) + 2*cosh(b*x + a) + 2*sinh(b*x + a)) - I*dilog(1/2*sqrt(4*I)
*(cosh(b*x + a) + sinh(b*x + a))) - I*dilog(-1/2*sqrt(4*I)*(cosh(b*x + a) +
 sinh(b*x + a))) + I*dilog(1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a)))
```

```
+ I*dilog(-1/2*sqrt(-4*I)*(cosh(b*x + a) + sinh(b*x + a))))/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}(\coth(a+bx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(coth(b*x+a)),x)
```

```
[Out] Integral(acot(coth(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}(\coth(bx+a))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(coth(b*x + a)), x)
```

3.204 $\int \frac{\cot^{-1}(\coth(a+bx))}{e+fx}\,dx$

Optimal. Leaf size=17

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(\coth(a+bx))}{e+fx},x\right)$$

```
[Out] CannotIntegrate[ArcCot[Coth[a + b*x]]/(e + f*x), x]
```

Rubi [A] time = 0.0368274, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(\coth(a+bx))}{e+fx}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[Coth[a + b*x]]/(e + f*x),x]
```

```
[Out] Defer[Int][ArcCot[Coth[a + b*x]]/(e + f*x), x]
```

Rubi steps

$$\int \frac{\cot^{-1}(\coth(a+bx))}{e+fx}\,dx=\int \frac{\cot^{-1}(\coth(a+bx))}{e+fx}\,dx$$

Mathematica [A] time = 0.773464, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(\coth(a+bx))}{e+fx}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[Coth[a + b*x]]/(e + f*x),x]
```

```
[Out] Integrate[ArcCot[Coth[a + b*x]]/(e + f*x), x]
```

Maple [A] time = 0.937, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(\coth(bx+a))}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(coth(b*x+a))/(f*x+e),x)
```

```
[Out] int(arccot(coth(b*x+a))/(f*x+e),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(\coth(bx+a))}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(coth(b*x+a))/(f*x+e),x, algorithm="maxima")
```

```
[Out] integrate(arccot(coth(b*x + a))/(f*x + e), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\operatorname{arccot}(\coth(bx+a))}{fx+e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(coth(b*x+a))/(f*x+e),x, algorithm="fricas")
```

```
[Out] integral(arccot(coth(b*x + a))/(f*x + e), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{acot}(\coth(a+bx))}{e+fx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(coth(b*x+a))/(f*x+e),x)
```

```
[Out] Integral(acot(coth(a + b*x))/(e + f*x), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}(\coth(bx+a))}{fx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(coth(b*x+a))/(f*x+e),x, algorithm="giac")
```

```
[Out] integrate(arccot(coth(b*x + a))/(f*x + e), x)
```

3.205 $\int x^2 \cot^{-1}(c + d \coth(a + bx))\,dx$

Optimal. Leaf size=351

$$\frac{ix\text{PolyLog}\left(3, \frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b^2} - \frac{ix\text{PolyLog}\left(3, \frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b^2} - \frac{i\text{PolyLog}\left(4, \frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^3} + \frac{i\text{PolyLog}\left(4, \frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{8b^3}$$

```
[Out] (x^3*ArcCot[c + d*Coth[a + b*x]])/3 - (I/6)*x^3*Log[1 - ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/6)*x^3*Log[1 - ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x^2*PolyLog[2, ((I - c - d)*E^(2*a + 2*b*x))/(I - c +
d)])/b + ((I/4)*x^2*PolyLog[2, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/
b + ((I/4)*x*PolyLog[3, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b^2 - (
(I/4)*x*PolyLog[3, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b^2 - ((I/8)
*PolyLog[4, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b^3 + ((I/8)*PolyLo
g[4, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b^3
```

Rubi [A] time = 0.462513, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 6, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5202, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3, \frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b^2} - \frac{ix\text{PolyLog}\left(3, \frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b^2} - \frac{i\text{PolyLog}\left(4, \frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^3} + \frac{i\text{PolyLog}\left(4, \frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{8b^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + d*Coth[a + b*x]],x]
```


```
[Out] (x^3*ArcCot[c + d*Coth[a + b*x]])/3 - (I/6)*x^3*Log[1 - ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/6)*x^3*Log[1 - ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x^2*PolyLog[2, ((I - c - d)*E^(2*a + 2*b*x))/(I - c +
d)])/b + ((I/4)*x^2*PolyLog[2, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/
b + ((I/4)*x*PolyLog[3, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b^2 - (
(I/4)*x*PolyLog[3, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b^2 - ((I/8)
*PolyLog[4, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b^3 + ((I/8)*PolyLo
g[4, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b^3
```


Rule 5202

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Coth[a + b*x]])/(f*(m
```

```
 + 1)), x] + (Dist[(I*b*(I - c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^
(2*a + 2*b*x))/(I - c + d - (I - c - d)*E^(2*a + 2*b*x)), x], x] - Dist[(I*
b*(I + c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*a + 2*b*x))/(I + c
- d - (I + c + d)*E^(2*a + 2*b*x)), x], x]) /; FreeQ[{a, b, c, d, e, f}, x]
 && IGtQ[m, 0] && NeQ[(c - d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c + d\coth(a + bx))\,dx = \frac{1}{3}x^3 \cot^{-1}(c + d\coth(a + bx)) + \frac{1}{3}(b(1 - i(c + d)))\int \frac{e^{2a+2bx}x^3}{i + c - d + (-i - c - d)e^{2a+2b}}$$

$$= \frac{1}{3}x^3 \cot^{-1}(c + d\coth(a + bx)) - \frac{1}{6}ix^3 \log\left(1 - \frac{(i - c - d)e^{2a+2bx}}{i - c + d}\right) + \frac{1}{6}ix^3 \log\left(1 - \right.$$

$$= \frac{1}{3}x^3 \cot^{-1}(c + d\coth(a + bx)) - \frac{1}{6}ix^3 \log\left(1 - \frac{(i - c - d)e^{2a+2bx}}{i - c + d}\right) + \frac{1}{6}ix^3 \log\left(1 - \right.$$

$$= \frac{1}{3}x^3 \cot^{-1}(c + d\coth(a + bx)) - \frac{1}{6}ix^3 \log\left(1 - \frac{(i - c - d)e^{2a+2bx}}{i - c + d}\right) + \frac{1}{6}ix^3 \log\left(1 - \right.$$

$$= \frac{1}{3}x^3 \cot^{-1}(c + d\coth(a + bx)) - \frac{1}{6}ix^3 \log\left(1 - \frac{(i - c - d)e^{2a+2bx}}{i - c + d}\right) + \frac{1}{6}ix^3 \log\left(1 - \right.$$

$$= \frac{1}{3}x^3 \cot^{-1}(c + d\coth(a + bx)) - \frac{1}{6}ix^3 \log\left(1 - \frac{(i - c - d)e^{2a+2bx}}{i - c + d}\right) + \frac{1}{6}ix^3 \log\left(1 - \right.$$

Mathematica [A] time = 5.39786, size = 299, normalized size = 0.85

$$\frac{1}{3}x^3 \cot^{-1}(d\coth(a + bx) + c) - \frac{i\left(6b^2x^2\text{PolyLog}\left(2, \frac{(c+d-i)e^{2(a+bx)}}{c-d-i}\right) - 6b^2x^2\text{PolyLog}\left(2, \frac{(c+d+i)e^{2(a+bx)}}{c-d+i}\right) - 6bx\text{PolyLog}\left(3\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + d*Coth[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + d*Coth[a + b*x]])/3 - ((I/24)*(4*b^3*x^3*Log[1 + ((-I + c +
 d)*E^(2*(a + b*x)))/(I - c + d)] - 4*b^3*x^3*Log[1 + ((I + c + d)*E^(2*(a
+ b*x)))/(-I - c + d)] + 6*b^2*x^2*PolyLog[2, ((-I + c + d)*E^(2*(a + b*x))
)/(-I + c - d)] - 6*b^2*x^2*PolyLog[2, ((I + c + d)*E^(2*(a + b*x)))/(I + c
 - d)] - 6*b*x*PolyLog[3, ((-I + c + d)*E^(2*(a + b*x)))/(-I + c - d)] + 6*
b*x*PolyLog[3, ((I + c + d)*E^(2*(a + b*x)))/(I + c - d)] + 3*PolyLog[4, ((
-I + c + d)*E^(2*(a + b*x)))/(-I + c - d)] - 3*PolyLog[4, ((I + c + d)*E^(2
*(a + b*x)))/(I + c - d)]))/b^3
```

Maple [C] time = 12.255, size = 6912, normalized size = 19.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+d*coth(b*x+a)),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\,x^{3}\arctan\left(e^{(2\,bx+2\,a)}-1,\left(ce^{(2\,a)}+de^{(2\,a)}\right)e^{(2\,bx)}-c+d\right)-4\,bd\int\frac{x^{3}e^{(2\,bx+2\,a)}}{3\left(c^{2}-2\,cd+d^{2}+\left(c^{2}e^{(4\,a)}+2\,cde^{(4\,a)}+d^{2}e^{(4\,a)}+e^{(4\,a)}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arctan2(e^(2*b*x + 2*a) - 1, (c*e^(2*a) + d*e^(2*a))*e^(2*b*x) - c
+ d) - 4*b*d*integrate(1/3*x^3*e^(2*b*x + 2*a)/(c^2 - 2*c*d + d^2 + (c^2*e^
(4*a) + 2*c*d*e^(4*a) + d^2*e^(4*a) + e^(4*a))*e^(4*b*x) - 2*(c^2*e^(2*a) -
 d^2*e^(2*a) + e^(2*a))*e^(2*b*x) + 1), x)
```

Fricas [C] time = 2.84954, size = 3614, normalized size = 10.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^3*arctan(sinh(b*x + a)/(d*cosh(b*x + a) + c*sinh(b*x + a))) -
3*I*b^2*x^2*dilog(1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 +
 1))*(cosh(b*x + a) + sinh(b*x + a))) - 3*I*b^2*x^2*dilog(-1/2*sqrt((4*c^2
- 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a
))) + 3*I*b^2*x^2*dilog(1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d +
 d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 3*I*b^2*x^2*dilog(-1/2*sqrt((
4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b
*x + a))) + I*a^3*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*
c*d + d^2 + 1)*sinh(b*x + a) + (c^2 - d^2 - 2*I*d + 1)*sqrt((4*c^2 - 4*d^2
+ 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + I*a^3*log(2*(c^2 + 2*c*d + d^2 + 1
)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 - 2*
```

```
I*d + 1)*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) - I*a^3
*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*si
nh(b*x + a) + (c^2 - d^2 + 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2
 - 2*c*d + d^2 + 1))) - I*a^3*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) +
 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 + 2*I*d + 1)*sqrt((4*
c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + 6*I*b*x*polylog(3, 1/2
*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) +
 sinh(b*x + a))) + 6*I*b*x*polylog(3, -1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)
/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) - 6*I*b*x*polylo
g(3, 1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*
x + a) + sinh(b*x + a))) - 6*I*b*x*polylog(3, -1/2*sqrt((4*c^2 - 4*d^2 - 8*
I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + (-I*b^
3*x^3 - I*a^3)*log(1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2
+ 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (-I*b^3*x^3 - I*a^3)*log(-1/2*
sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) +
sinh(b*x + a)) + 1) + (I*b^3*x^3 + I*a^3)*log(1/2*sqrt((4*c^2 - 4*d^2 - 8*I
*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*
b^3*x^3 + I*a^3)*log(-1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d
^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) - 6*I*polylog(4, 1/2*sqrt((4*
c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x
 + a))) - 6*I*polylog(4, -1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d
 + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 6*I*polylog(4, 1/2*sqrt((4*
c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x
 + a))) + 6*I*polylog(4, -1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d
 + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+d*coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(d \coth(bx + a) + c)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+d*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(d*coth(b*x + a) + c), x)
```

3.206 $\int x \cot^{-1}(c + d \coth(a + bx))\, dx$

Optimal. Leaf size=265

$$\frac{i\text{PolyLog}\left(3,\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^2}-\frac{i\text{PolyLog}\left(3,\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{8b^2}-\frac{ix\text{PolyLog}\left(2,\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{ix\text{PolyLog}\left(2,\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}$$

```
[Out] (x^2*ArcCot[c + d*Coth[a + b*x]])/2 - (I/4)*x^2*Log[1 - ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/4)*x^2*Log[1 - ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x*PolyLog[2, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)
])/b + ((I/4)*x*PolyLog[2, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b +
((I/8)*PolyLog[3, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b^2 - ((I/8)*
PolyLog[3, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b^2
```

Rubi [A] time = 0.376471, antiderivative size = 265, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {5202, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3,\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{8b^2}-\frac{i\text{PolyLog}\left(3,\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{8b^2}-\frac{ix\text{PolyLog}\left(2,\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{ix\text{PolyLog}\left(2,\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + d*Coth[a + b*x]],x]
```


```
[Out] (x^2*ArcCot[c + d*Coth[a + b*x]])/2 - (I/4)*x^2*Log[1 - ((I - c - d)*E^(2*a
 + 2*b*x))/(I - c + d)] + (I/4)*x^2*Log[1 - ((I + c + d)*E^(2*a + 2*b*x))/(
I + c - d)] - ((I/4)*x*PolyLog[2, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)
])/b + ((I/4)*x*PolyLog[2, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b +
((I/8)*PolyLog[3, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b^2 - ((I/8)*
PolyLog[3, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b^2
```


Rule 5202

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Coth[a + b*x]])/(f*(m
 + 1)), x] + (Dist[(I*b*(I - c - d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^
(2*a + 2*b*x))/(I - c + d - (I - c - d)*E^(2*a + 2*b*x)), x], x] - Dist[(I*
b*(I + c + d))/(f*(m + 1)), Int[((e + f*x)^(m + 1)*E^(2*a + 2*b*x))/(I + c
- d - (I + c + d)*E^(2*a + 2*b*x)), x], x]) /; FreeQ[{a, b, c, d, e, f}, x]
```

```
&& IGtQ[m, 0] && NeQ[(c - d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+d\coth(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+d\coth(a+bx)) + \frac{1}{2}(b(1-i(c+d)))\int \frac{e^{2a+2bx}x^2}{i+c-d+(-i-c-d)e^{2a+2bx}}$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(i\right.$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(i\right.$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(i\right.$$

$$= \frac{1}{2}x^2\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{4}ix^2\log\left(1-\frac{(i\right.$$

Mathematica [A] time = 4.0357, size = 225, normalized size = 0.85

$$\frac{1}{2}x^2\cot^{-1}(d\coth(a+bx)+c) - \frac{i\left(2bx\text{PolyLog}\left(2,\frac{(c+d-i)e^{2(a+bx)}}{c-d-i}\right) - 2bx\text{PolyLog}\left(2,\frac{(c+d+i)e^{2(a+bx)}}{c-d+i}\right) - \text{PolyLog}\left(3,\frac{(c+d-i)}{c-}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + d*Coth[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + d*Coth[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 + ((-I + c +
d)*E^(2*(a + b*x)))/(I - c + d)] - 2*b^2*x^2*Log[1 + ((I + c + d)*E^(2*(a +
 b*x)))/(-I - c + d)] + 2*b*x*PolyLog[2, ((-I + c + d)*E^(2*(a + b*x)))/(-I
 + c - d)] - 2*b*x*PolyLog[2, ((I + c + d)*E^(2*(a + b*x)))/(I + c - d)] -
PolyLog[3, ((-I + c + d)*E^(2*(a + b*x)))/(-I + c - d)] + PolyLog[3, ((I +
c + d)*E^(2*(a + b*x)))/(I + c - d)]))/b^2
```

Maple [C] time = 20.174, size = 6514, normalized size = 24.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+d*coth(b*x+a)),x)
```

[Out] result too large to display

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}x^2\arctan\left(e^{(2bx+2a)}-1,\left(ce^{(2a)}+de^{(2a)}\right)e^{(2bx)}-c+d\right)-2bd\int\frac{x^2e^{(2bx+2a)}}{c^2-2cd+d^2+\left(c^2e^{(4a)}+2cde^{(4a)}+d^2e^{(4a)}+e^{(4a)}\right)e^{(\cdot}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arctan2(e^(2*b*x + 2*a) - 1, (c*e^(2*a) + d*e^(2*a))*e^(2*b*x) - c
+ d) - 2*b*d*integrate(x^2*e^(2*b*x + 2*a)/(c^2 - 2*c*d + d^2 + (c^2*e^(4*a
) + 2*c*d*e^(4*a) + d^2*e^(4*a) + e^(4*a))*e^(4*b*x) - 2*(c^2*e^(2*a) - d^2
*e^(2*a) + e^(2*a))*e^(2*b*x) + 1), x)
```

Fricas [C] time = 2.5611, size = 2963, normalized size = 11.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*b^2*x^2*arctan(sinh(b*x + a)/(d*cosh(b*x + a) + c*sinh(b*x + a))) -
2*I*b*x*dilog(1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))
*(cosh(b*x + a) + sinh(b*x + a))) - 2*I*b*x*dilog(-1/2*sqrt((4*c^2 - 4*d^2
+ 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 2*
I*b*x*dilog(1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(
cosh(b*x + a) + sinh(b*x + a))) + 2*I*b*x*dilog(-1/2*sqrt((4*c^2 - 4*d^2 -
8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) - I*a^
2*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*s
inh(b*x + a) + (c^2 - d^2 - 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^
2 - 2*c*d + d^2 + 1))) - I*a^2*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a)
+ 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 - 2*I*d + 1)*sqrt((4
*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + I*a^2*log(2*(c^2 + 2*
c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) + (c
^2 - d^2 + 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 +
 1))) + I*a^2*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d
```

```
+ d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 + 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 - 8*
I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) + (-I*b^2*x^2 + I*a^2)*log(1/2*sqrt((4*c
^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x
+ a)) + 1) + (-I*b^2*x^2 + I*a^2)*log(-1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)
/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^2*x^2
 - I*a^2)*log(1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))
*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b^2*x^2 - I*a^2)*log(-1/2*sqrt((
4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b
*x + a)) + 1) + 2*I*polylog(3, 1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 -
2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + 2*I*polylog(3, -1/2*sq
rt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + si
nh(b*x + a))) - 2*I*polylog(3, 1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 -
2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) - 2*I*polylog(3, -1/2*sq
rt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + si
nh(b*x + a))))/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+d*coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}(d \coth(bx + a) + c) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+d*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(d*coth(b*x + a) + c), x)
```

3.207 $\int \cot^{-1}(c+d\coth(a+bx))\,dx$

Optimal. Leaf size=174

$$-\frac{i\text{PolyLog}\left(2,\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{i\text{PolyLog}\left(2,\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}-\frac{1}{2}ix\log\left(1-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)+\frac{1}{2}ix\log\left(1-\frac{(c+d+i)}{c-d}\right.$$

```
[Out] x*ArcCot[c + d*Coth[a + b*x]] - (I/2)*x*Log[1 - ((I - c - d)*E^(2*a + 2*b*x
))/(I - c + d)] + (I/2)*x*Log[1 - ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)
] - ((I/4)*PolyLog[2, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b + ((I/4
)*PolyLog[2, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b
```

Rubi [A] time = 0.23187, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {5194, 2190, 2279, 2391}

$$-\frac{i\text{PolyLog}\left(2,\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)}{4b}+\frac{i\text{PolyLog}\left(2,\frac{(c+d+i)e^{2a+2bx}}{c-d+i}\right)}{4b}-\frac{1}{2}ix\log\left(1-\frac{(-c-d+i)e^{2a+2bx}}{-c+d+i}\right)+\frac{1}{2}ix\log\left(1-\frac{(c+d+i)}{c-d}\right.$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + d*Coth[a + b*x]],x]
```

```
[Out] x*ArcCot[c + d*Coth[a + b*x]] - (I/2)*x*Log[1 - ((I - c - d)*E^(2*a + 2*b*x
))/(I - c + d)] + (I/2)*x*Log[1 - ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)
] - ((I/4)*PolyLog[2, ((I - c - d)*E^(2*a + 2*b*x))/(I - c + d)])/b + ((I/4
)*PolyLog[2, ((I + c + d)*E^(2*a + 2*b*x))/(I + c - d)])/b
```

Rule 5194

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)], x_Symbol] :> Simp[x*Arc
Cot[c + d*Coth[a + b*x]], x] + (Dist[I*b*(I - c - d), Int[(x*E^(2*a + 2*b*x
))/(I - c + d - (I - c - d)*E^(2*a + 2*b*x)), x], x] - Dist[I*b*(I + c + d)
, Int[(x*E^(2*a + 2*b*x))/(I + c - d - (I + c + d)*E^(2*a + 2*b*x)), x], x]
) /; FreeQ[{a, b, c, d}, x] && NeQ[(c - d)^2, -1]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
```

```
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c+d\coth(a+bx))\,dx = x\cot^{-1}(c+d\coth(a+bx)) + (b(1-i(c+d)))\int \frac{e^{2a+2bx}x}{i+c-d+(-i-c-d)e^{2a+2bx}}\,dx - ($$

$$= x\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{2}ix\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{2}ix\log\left(1-\frac{(i+c+}{i+}\right.$$

$$= x\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{2}ix\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{2}ix\log\left(1-\frac{(i+c+}{i+}\right.$$

$$= x\cot^{-1}(c+d\coth(a+bx)) - \frac{1}{2}ix\log\left(1-\frac{(i-c-d)e^{2a+2bx}}{i-c+d}\right) + \frac{1}{2}ix\log\left(1-\frac{(i+c+}{i+}\right.$$

Mathematica [A] time = 1.21804, size = 287, normalized size = 1.65

$$x\cot^{-1}(d\coth(a+bx)+c) - \frac{d\text{PolyLog}\left(2,\frac{(c^2+2cd+d^2+1)e^{2(a+bx)}}{c^2-d^2+2\sqrt{-d^2}+1}\right) - d\text{PolyLog}\left(2,-\frac{(c^2+2cd+d^2+1)e^{2(a+bx)}}{-c^2+d^2+2\sqrt{-d^2}-1}\right) + 2d(a+bx)\log(}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[c + d*Coth[a + b*x]],x]
```

```
[Out] x*ArcCot[c + d*Coth[a + b*x]] - (4*a*Sqrt[-d^2]*ArcTan[(1 + c^2 - d^2 - (1
+ c^2 + 2*c*d + d^2)*E^(2*(a + b*x)))/(2*d)] + 2*d*(a + b*x)*Log[1 - ((1 +
```

```
(c + d)^2)*E^(2*(a + b*x)))/(1 + c^2 - d^2 + 2*Sqrt[-d^2])] - 2*d*(a + b*x)
*Log[1 + ((1 + (c + d)^2)*E^(2*(a + b*x)))/(-1 - c^2 + d^2 + 2*Sqrt[-d^2])]
 + d*PolyLog[2, ((1 + c^2 + 2*c*d + d^2)*E^(2*(a + b*x)))/(1 + c^2 - d^2 +
2*Sqrt[-d^2])] - d*PolyLog[2, -(((1 + c^2 + 2*c*d + d^2)*E^(2*(a + b*x)))/(
-1 - c^2 + d^2 + 2*Sqrt[-d^2]))])/(4*b*Sqrt[-d^2])
```

Maple [B] time = 0.095, size = 350, normalized size = 2.

$$-\frac{\operatorname{arccot}(c+d\coth(bx+a))\ln(d\coth(bx+a)-d)}{2b}+\frac{\operatorname{arccot}(c+d\coth(bx+a))\ln(d\coth(bx+a)+d)}{2b}+\frac{\frac{i}{4}\ln(d\coth$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*coth(b*x+a)),x)
```

```
[Out] -1/2/b*arccot(c+d*coth(b*x+a))*ln(d*coth(b*x+a)-d)+1/2/b*arccot(c+d*coth(b*
x+a))*ln(d*coth(b*x+a)+d)+1/4*I/b*ln(d*coth(b*x+a)-d)*ln((-d*coth(b*x+a)+I-
c)/(I-c-d))-1/4*I/b*ln(d*coth(b*x+a)-d)*ln((d*coth(b*x+a)+c+I)/(I+c+d))+1/4
*I/b*dilog((-d*coth(b*x+a)+I-c)/(I-c-d))-1/4*I/b*dilog((d*coth(b*x+a)+c+I)/
(I+c+d))-1/4*I/b*ln(d*coth(b*x+a)+d)*ln((-d*coth(b*x+a)+I-c)/(I-c+d))+1/4*I
/b*ln(d*coth(b*x+a)+d)*ln((d*coth(b*x+a)+c+I)/(I+c-d))-1/4*I/b*dilog((-d*co
th(b*x+a)+I-c)/(I-c+d))+1/4*I/b*dilog((d*coth(b*x+a)+c+I)/(I+c-d))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-4\,bd\int\frac{xe^{(2\,bx+2\,a)}}{c^2-2\,cd+d^2+\left(c^2e^{(4\,a)}+2\,cde^{(4\,a)}+d^2e^{(4\,a)}+e^{(4\,a)}\right)e^{(4\,bx)}-2\left(c^2e^{(2\,a)}-d^2e^{(2\,a)}+e^{(2\,a)}\right)e^{(2\,bx)}+1}\,dx+x\arctan($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] -4*b*d*integrate(x*e^(2*b*x + 2*a)/(c^2 - 2*c*d + d^2 + (c^2*e^(4*a) + 2*c*
d*e^(4*a) + d^2*e^(4*a) + e^(4*a))*e^(4*b*x) - 2*(c^2*e^(2*a) - d^2*e^(2*a)
 + e^(2*a))*e^(2*b*x) + 1), x) + x*arctan2(e^(2*b*x + 2*a) - 1, (c*e^(2*a)
+ d*e^(2*a))*e^(2*b*x) - c + d)
```

Fricas [B] time = 5.70609, size = 2272, normalized size = 13.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x*arctan(sinh(b*x + a)/(d*cosh(b*x + a) + c*sinh(b*x + a))) + I*a*
log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sin
h(b*x + a) + (c^2 - d^2 - 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2
- 2*c*d + d^2 + 1))) + I*a*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*
(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) - (c^2 - d^2 - 2*I*d + 1)*sqrt((4*c^2
 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))) - I*a*log(2*(c^2 + 2*c*d +
d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 + 1)*sinh(b*x + a) + (c^2 - d
^2 + 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1)))
- I*a*log(2*(c^2 + 2*c*d + d^2 + 1)*cosh(b*x + a) + 2*(c^2 + 2*c*d + d^2 +
1)*sinh(b*x + a) - (c^2 - d^2 + 2*I*d + 1)*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)
/(c^2 - 2*c*d + d^2 + 1))) + (-I*b*x - I*a)*log(1/2*sqrt((4*c^2 - 4*d^2 + 8
*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (
-I*b*x - I*a)*log(-1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2
+ 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) + (I*b*x + I*a)*log(1/2*sqrt((4*
c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x
 + a)) + 1) + (I*b*x + I*a)*log(-1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2
- 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a)) + 1) - I*dilog(1/2*sqrt
((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh
(b*x + a))) - I*dilog(-1/2*sqrt((4*c^2 - 4*d^2 + 8*I*d + 4)/(c^2 - 2*c*d +
d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) + I*dilog(1/2*sqrt((4*c^2 - 4*d^
2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cosh(b*x + a) + sinh(b*x + a))) +
I*dilog(-1/2*sqrt((4*c^2 - 4*d^2 - 8*I*d + 4)/(c^2 - 2*c*d + d^2 + 1))*(cos
h(b*x + a) + sinh(b*x + a))))/b
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(d \coth\left(bx+a\right)+c\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(d*coth(b*x + a) + c), x)
```

3.208 $\int \frac{\cot^{-1}(c+d\coth(a+bx))}{x}\,dx$

Optimal. Leaf size=17

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(d\coth(a+bx)+c)}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + d*Coth[a + b*x]]/x, x]
```

Rubi [A] time = 0.0794915, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{\cot^{-1}(c+d\coth(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + d*Coth[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + d*Coth[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+d\coth(a+bx))}{x}\,dx = \int \frac{\cot^{-1}(c+d\coth(a+bx))}{x}\,dx$$

Mathematica [A] time = 5.20924, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+d\coth(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + d*Coth[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + d*Coth[a + b*x]]/x, x]
```

Maple [A] time = 0.382, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c+d\coth\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+d*coth(b*x+a))/x,x)
```

```
[Out] int(arccot(c+d*coth(b*x+a))/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(d\coth\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*coth(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] integrate(arccot(d*coth(b*x + a) + c)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{\operatorname{arccot}\left(d\coth\left(bx+a\right)+c\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*coth(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(arccot(d*coth(b*x + a) + c)/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+d*coth(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(d\coth\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+d*coth(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot(d*coth(b*x + a) + c)/x, x)
```

3.209 $\int x^2 \cot^{-1}(c+(i+c)\coth(a+bx))\,dx$

Optimal. Leaf size=142

$$\frac{ix\text{PolyLog}\left(3,ice^{2a+2bx}\right)}{4b^2}-\frac{i\text{PolyLog}\left(4,ice^{2a+2bx}\right)}{8b^3}-\frac{ix^2\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)+\frac{1}{3}x^3\cot^{-1}(c$$

```
[Out] (I/12)*b*x^4 + (x^3*ArcCot[c + (I + c)*Coth[a + b*x]])/3 - (I/6)*x^3*Log[1
- I*c*E^(2*a + 2*b*x)] - ((I/4)*x^2*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b + ((
I/4)*x*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2 - ((I/8)*PolyLog[4, I*c*E^(2*a
+ 2*b*x)])/b^3
```

Rubi [A] time = 0.231327, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {5198, 2184, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3,ice^{2a+2bx}\right)}{4b^2}-\frac{i\text{PolyLog}\left(4,ice^{2a+2bx}\right)}{8b^3}-\frac{ix^2\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)+\frac{1}{3}x^3\cot^{-1}(c$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c + (I + c)*Coth[a + b*x]],x]
```


```
[Out] (I/12)*b*x^4 + (x^3*ArcCot[c + (I + c)*Coth[a + b*x]])/3 - (I/6)*x^3*Log[1
- I*c*E^(2*a + 2*b*x)] - ((I/4)*x^2*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b + ((
I/4)*x*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2 - ((I/8)*PolyLog[4, I*c*E^(2*a
+ 2*b*x)])/b^3
```


Rule 5198

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Coth[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d - c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2\cot^{-1}(c+(i+c)\coth(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))+\frac{1}{3}b\int\frac{x^3}{-i-ce^{2a+2bx}}\,dx$$
$$=\frac{1}{12}ibx^4+\frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))+\frac{1}{3}(ibc)\int\frac{e^{2a+2bx}x^3}{-i-ce^{2a+2bx}}\,dx$$
$$=\frac{1}{12}ibx^4+\frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)+\frac{1}{2}i\int$$
$$=\frac{1}{12}ibx^4+\frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)-\frac{ix^2\mathrm{Li}}{}$$
$$=\frac{1}{12}ibx^4+\frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)-\frac{ix^2\mathrm{Li}}{}$$
$$=\frac{1}{12}ibx^4+\frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)-\frac{ix^2\mathrm{Li}}{}$$
$$=\frac{1}{12}ibx^4+\frac{1}{3}x^3\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{6}ix^3\log\left(1-ice^{2a+2bx}\right)-\frac{ix^2\mathrm{Li}}{}$$

Mathematica [A] time = 0.171583, size = 128, normalized size = 0.9

$$\frac{1}{3}x^3\cot^{-1}(c+(c+i)\coth(a+bx))-\frac{i\left(-6b^2x^2\mathrm{PolyLog}\left(2,-\frac{ie^{-2(a+bx)}}{c}\right)-6bx\mathrm{PolyLog}\left(3,-\frac{ie^{-2(a+bx)}}{c}\right)-3\mathrm{PolyLog}\left(4,-\frac{ie^{-}}{}\right.\right.}{24b^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c + (I + c)*Coth[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + (I + c)*Coth[a + b*x]])/3 - ((I/24)*(4*b^3*x^3*Log[1 + I/(c
*E^(2*(a + b*x)))] - 6*b^2*x^2*PolyLog[2, (-I)/(c*E^(2*(a + b*x)))] - 6*b*x
*PolyLog[3, (-I)/(c*E^(2*(a + b*x)))] - 3*PolyLog[4, (-I)/(c*E^(2*(a + b*x)
))]))/b^3
```

Maple [C] time = 14.447, size = 1548, normalized size = 10.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c+(I+c)*coth(b*x+a)),x)
```

```
[Out] -1/3*I/b^3*c*a^3/(I+c)*ln(exp(b*x+a))+1/3*I/b^2*c/(I+c)*x*a^3-1/12*Pi*x^3*c
sgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^3+1/12*Pi*x^3*csgn((2*I*ex
p(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2+1/6*I*x^3*ln(2*exp(2
*b*x+2*a)*c+2*I)+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*exp(2*b*x
+2*a)*c+2*I))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))-1/12*Pi*x
^3*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c
))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))+1/2*I
/b^2*ln(1-I*c*exp(2*b*x+2*a))*x*a^2-1/2*I/b^2*a^2*ln(1-I*exp(b*x+a)*(-I*c)^
(1/2))*x-1/8*I*polylog(4,I*c*exp(2*b*x+2*a))/b^3+1/4*I*x*polylog(3,I*c*exp(
2*b*x+2*a))/b^2+1/12*I*b*c/(I+c)*x^4+1/4*I/b^3*c/(I+c)*a^4+1/12*Pi*x^3*csgn
((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^2+1/3/b^3*a^3/(I+c)*ln(exp(b*
x+a))-1/3/b^2/(I+c)*x*a^3+1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(
2*b*x+2*a)-1))^3+1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a
)-1))*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))-1/12*Pi*x^3*csgn(I*
(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))*csgn((2*I*exp(2
*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))+1/6*I/b^3*a^3*ln(exp(2*b*
x+2*a)*c+I)-1/6*I*x^3*ln(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)-1/12*Pi*x^3
*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))*csgn((2*exp(2*b*x+2*a)
*c+2*I)/(exp(2*b*x+2*a)-1))^2-1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c+2*I))*
csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^2+1/12*Pi*x^3*csgn(I*(2
*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b
*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/6*I*x^3*ln(1-I*c*exp(2*b*x+2*a))+1/3*I/b
^3*ln(1-I*c*exp(2*b*x+2*a))*a^3+1/4*I/b^3*polylog(2,I*c*exp(2*b*x+2*a))*a^2
-1/2*I/b^3*a^3*ln(1-I*exp(b*x+a)*(-I*c)^(1/2))-1/2*I/b^3*a^3*ln(1+I*exp(b*x
+a)*(-I*c)^(1/2))-1/2*I/b^3*a^2*dilog(1-I*exp(b*x+a)*(-I*c)^(1/2))-1/2*I/b^
3*a^2*dilog(1+I*exp(b*x+a)*(-I*c)^(1/2))-1/12*Pi*x^3*csgn((2*I*exp(2*b*x+2*
a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^3+1/12*Pi*x^3*csgn(I*(2*I*exp(2*
b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))*csgn((2*I*exp(2*b*x+2*a)+2
*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)
-1))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^2+1/12*Pi*x^3*csgn
(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(
2*b*x+2*a)-1))^2-1/4/b^3/(I+c)*a^4-1/12*b/(I+c)*x^4-1/12*Pi*x^3*csgn(I*(2*I
*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^3-1/4*I*x^2*polylog
(2,I*c*exp(2*b*x+2*a))/b-1/2*I/b^2*a^2*ln(1+I*exp(b*x+a)*(-I*c)^(1/2))*x
```

Maxima [A] time = 5.84094, size = 174, normalized size = 1.23

$$\frac{1}{3}\,x^{3}\,\operatorname{arccot}\left((c+i)\coth\left(bx+a\right)+c\right)-\frac{4}{9}\left(\frac{3\,x^{4}}{4i\,c-4}-\frac{4\,b^{3}x^{3}\log\left(-i\,ce^{(2\,bx+2\,a)}+1\right)+6\,b^{2}x^{2}\mathrm{Li}_{2}\left(i\,ce^{(2\,bx+2\,a)}\right)-6\,bx\mathrm{Li}_{3}(i}{-2\,b^{4}(-i\,c+1)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(I+c)*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot((c + I)*coth(b*x + a) + c) - 4/9*(3*x^4/(4*I*c - 4) - (4*b^3
*x^3*log(-I*c*e^(2*b*x + 2*a) + 1) + 6*b^2*x^2*dilog(I*c*e^(2*b*x + 2*a)) -
 6*b*x*polylog(3, I*c*e^(2*b*x + 2*a)) + 3*polylog(4, I*c*e^(2*b*x + 2*a)))
/(b^4*(2*I*c - 2)))*b*(c + I)
```

Fricas [C] time = 2.06872, size = 856, normalized size = 6.03

$$\frac{i\,b^4x^4 + 2i\,b^3x^3\log\left(\frac{\left(ce^{(2\,bx+2\,a)}+i\right)e^{(-2\,bx-2\,a)}}{c+i}\right) - 6i\,b^2x^2\mathrm{Li}_2\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right) - 6i\,b^2x^2\mathrm{Li}_2\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right) - i\,a^4 + 2i\,a^3\log\left(\frac{2\,ce}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(I+c)*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(I*b^4*x^4 + 2*I*b^3*x^3*log((c*e^(2*b*x + 2*a) + I)*e^(-2*b*x - 2*a)/
(c + I)) - 6*I*b^2*x^2*dilog(1/2*sqrt(4*I*c)*e^(b*x + a)) - 6*I*b^2*x^2*dil
og(-1/2*sqrt(4*I*c)*e^(b*x + a)) - I*a^4 + 2*I*a^3*log(1/2*(2*c*e^(b*x + a)
 + I*sqrt(4*I*c))/c) + 2*I*a^3*log(1/2*(2*c*e^(b*x + a) - I*sqrt(4*I*c))/c)
 + 12*I*b*x*polylog(3, 1/2*sqrt(4*I*c)*e^(b*x + a)) + 12*I*b*x*polylog(3, -
1/2*sqrt(4*I*c)*e^(b*x + a)) + (-2*I*b^3*x^3 - 2*I*a^3)*log(1/2*sqrt(4*I*c)
*e^(b*x + a) + 1) + (-2*I*b^3*x^3 - 2*I*a^3)*log(-1/2*sqrt(4*I*c)*e^(b*x +
a) + 1) - 12*I*polylog(4, 1/2*sqrt(4*I*c)*e^(b*x + a)) - 12*I*polylog(4, -1
/2*sqrt(4*I*c)*e^(b*x + a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c+(I+c)*coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}((c+i)\coth(bx+a)+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c+(I+c)*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot((c + I)*coth(b*x + a) + c), x)
```

3.210 $\int x \cot^{-1}(c + (i + c) \coth(a + bx)) \, dx$

Optimal. Leaf size=113

$$\frac{i\text{PolyLog}\left(3, ice^{2a+2bx}\right)}{8b^2} - \frac{ix\text{PolyLog}\left(2, ice^{2a+2bx}\right)}{4b} - \frac{1}{4}ix^2 \log\left(1 - ice^{2a+2bx}\right) + \frac{1}{2}x^2 \cot^{-1}(c + (c+i)\coth(a+bx)) + \frac{1}{6}ib$$

```
[Out] (I/6)*b*x^3 + (x^2*ArcCot[c + (I + c)*Coth[a + b*x]])/2 - (I/4)*x^2*Log[1 -
 I*c*E^(2*a + 2*b*x)] - ((I/4)*x*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b + ((I/8
)*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2
```

Rubi [A] time = 0.202609, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.353, Rules used = {5198, 2184, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3, ice^{2a+2bx}\right)}{8b^2} - \frac{ix\text{PolyLog}\left(2, ice^{2a+2bx}\right)}{4b} - \frac{1}{4}ix^2 \log\left(1 - ice^{2a+2bx}\right) + \frac{1}{2}x^2 \cot^{-1}(c + (c+i)\coth(a+bx)) + \frac{1}{6}ib$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c + (I + c)*Coth[a + b*x]],x]
```

```
[Out] (I/6)*b*x^3 + (x^2*ArcCot[c + (I + c)*Coth[a + b*x]])/2 - (I/4)*x^2*Log[1 -
 I*c*E^(2*a + 2*b*x)] - ((I/4)*x*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b + ((I/8
)*PolyLog[3, I*c*E^(2*a + 2*b*x)])/b^2
```

Rule 5198

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Coth[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d - c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}(c+(i+c)\coth(a+bx))\,dx = \frac{1}{2}x^2\cot^{-1}(c+(i+c)\coth(a+bx)) + \frac{1}{2}b\int \frac{x^2}{-i-ce^{2a+2bx}}\,dx$$
$$= \frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c+(i+c)\coth(a+bx)) + \frac{1}{2}(ibc)\int \frac{e^{2a+2bx}x^2}{-i-ce^{2a+2bx}}\,dx$$
$$= \frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c+(i+c)\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) + \frac{1}{2}i\int x$$
$$= \frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c+(i+c)\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) - \frac{ix\text{Li}_2\left(i\right.}{4}$$
$$= \frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c+(i+c)\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) - \frac{ix\text{Li}_2\left(i\right.}{4}$$
$$= \frac{1}{6}ibx^3 + \frac{1}{2}x^2\cot^{-1}(c+(i+c)\coth(a+bx)) - \frac{1}{4}ix^2\log\left(1-ice^{2a+2bx}\right) - \frac{ix\text{Li}_2\left(i\right.}{4}$$

Mathematica [A] time = 0.0911226, size = 102, normalized size = 0.9

$$\frac{1}{2}x^2\cot^{-1}(c+(c+i)\coth(a+bx)) - \frac{i\left(-2bx\text{PolyLog}\left(2,-\frac{ie^{-2(a+bx)}}{c}\right) - \text{PolyLog}\left(3,-\frac{ie^{-2(a+bx)}}{c}\right) + 2b^2x^2\log\left(1+\frac{ie^{-2(a+bx)}}{c}\right)\right.}{8b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c + (I + c)*Coth[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (I + c)*Coth[a + b*x]])/2 - ((I/8)*(2*b^2*x^2*Log[1 + I/(c*
E^(2*(a + b*x)))] - 2*b*x*PolyLog[2, (-I)/(c*E^(2*(a + b*x)))] - PolyLog[3,
 (-I)/(c*E^(2*(a + b*x)))]))/b^2
```

Maple [C] time = 6.462, size = 1512, normalized size = 13.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c+(I+c)*coth(b*x+a)),x)
```

```
[Out] 1/4*I*x^2*ln(2*exp(2*b*x+2*a)*c+2*I)-1/8*Pi*x^2*csgn((2*I*exp(2*b*x+2*a)+2*
exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^3-1/4*I/b^2*ln(1-I*c*exp(2*b*x+2*a))*
a^2-1/4*I/b^2*polylog(2,I*c*exp(2*b*x+2*a))*a+1/2*I/b^2*a^2*ln(1-I*exp(b*x+
```

```
a)*(-I*c)^(1/2))+1/2*I/b^2*a^2*ln(1+I*exp(b*x+a)*(-I*c)^(1/2))+1/2*I/b^2*a*
dilog(1-I*exp(b*x+a)*(-I*c)^(1/2))+1/2*I/b^2*a*dilog(1+I*exp(b*x+a)*(-I*c)^
(1/2))-1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I
)/(exp(2*b*x+2*a)-1))^2+1/8*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2
*a)*c))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^
2+1/8*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)
-1))*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2+1/8
*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))*csgn((2*exp(2*b
*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))-1/8*Pi*x^2*csgn(I*(2*I*exp(2*b*x+2*a)+2*
exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*x+
2*a)*c)/(exp(2*b*x+2*a)-1))-1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp
(2*b*x+2*a)-1))*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^2-1/4*I/b
^2*a^2*ln(exp(2*b*x+2*a)*c+I)-1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c+2*I))*c
sgn(I*(2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^2-1/2/b^2*a^2/(I+c)*ln(e
xp(b*x+a))+1/2/b/(I+c)*x*a^2-1/8*Pi*x^2*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(
2*b*x+2*a)-1))^3+1/8*I*polylog(3,I*c*exp(2*b*x+2*a))/b^2-1/8*Pi*x^2*csgn(I*
(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^3-1/3*I/b^2*c/(
I+c)*a^3+1/6*I*b*c/(I+c)*x^3+1/8*Pi*x^2*csgn((2*I*exp(2*b*x+2*a)+2*exp(2*b*
x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/4*I*x^2*ln(1-I*c*exp(2*b*x+2*a))+1/8*Pi*x
^2*csgn((2*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^2+1/8*Pi*x^2*csgn(I*(2
*exp(2*b*x+2*a)*c+2*I)/(exp(2*b*x+2*a)-1))^3+1/3/b^2/(I+c)*a^3-1/6*b/(I+c)*
x^3-1/4*I*x^2*ln(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)+1/8*Pi*x^2*csgn(I/(
exp(2*b*x+2*a)-1))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*
x+2*a)-1))^2-1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*I*exp(2*b*x+2*
a)+2*exp(2*b*x+2*a)*c))*csgn(I*(2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp
(2*b*x+2*a)-1))-1/2*I/b*ln(1-I*c*exp(2*b*x+2*a))*x*a+1/2*I/b*a*ln(1-I*exp(b
*x+a)*(-I*c)^(1/2))*x+1/2*I/b*a*ln(1+I*exp(b*x+a)*(-I*c)^(1/2))*x+1/2*I/b^2
*c*a^2/(I+c)*ln(exp(b*x+a))-1/2*I/b*c/(I+c)*x*a^2+1/8*Pi*x^2*csgn(I/(exp(2*
b*x+2*a)-1))*csgn(I*(2*exp(2*b*x+2*a)*c+2*I))*csgn(I*(2*exp(2*b*x+2*a)*c+2*
I)/(exp(2*b*x+2*a)-1))-1/4*I*x*polylog(2,I*c*exp(2*b*x+2*a))/b
```

Maxima [A] time = 5.88556, size = 144, normalized size = 1.27

$$-\left(\frac{2\,x^3}{3i\,c-3}-\frac{2\,b^2x^2\log\left(-i\,ce^{(2\,bx+2\,a)}+1\right)+2\,bx\mathrm{Li}_2\left(i\,ce^{(2\,bx+2\,a)}\right)-\mathrm{Li}_3(i\,ce^{(2\,bx+2\,a)})}{-2\,b^3(-i\,c+1)}\right)b(c+i)+\frac{1}{2}\,x^2\,\mathrm{arccot}\,((c+i)\coth$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(I+c)*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] -(2*x^3/(3*I*c - 3) - (2*b^2*x^2*log(-I*c*e^(2*b*x + 2*a) + 1) + 2*b*x*dilo
g(I*c*e^(2*b*x + 2*a)) - polylog(3, I*c*e^(2*b*x + 2*a)))/(b^3*(2*I*c - 2))
```

```
)*b*(c + I) + 1/2*x^2*arccot((c + I)*coth(b*x + a) + c)
```

Fricas [C] time = 2.16808, size = 709, normalized size = 6.27

$$\frac{2i\,b^3x^3+3i\,b^2x^2\log\left(\frac{\left(ce^{(2\,bx+2\,a)}+i\right)e^{(-2\,bx-2\,a)}}{c+i}\right)+2i\,a^3-6i\,bx\mathrm{Li}_2\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right)-6i\,bx\mathrm{Li}_2\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}\right)-3i\,a^2\log\left(\frac{2\,ce^{(b}\cdots}{\cdots}\right)\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(I+c)*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(2*I*b^3*x^3 + 3*I*b^2*x^2*log((c*e^(2*b*x + 2*a) + I)*e^(-2*b*x - 2*a
)/(c + I)) + 2*I*a^3 - 6*I*b*x*dilog(1/2*sqrt(4*I*c)*e^(b*x + a)) - 6*I*b*x
*dilog(-1/2*sqrt(4*I*c)*e^(b*x + a)) - 3*I*a^2*log(1/2*(2*c*e^(b*x + a) + I
*sqrt(4*I*c))/c) - 3*I*a^2*log(1/2*(2*c*e^(b*x + a) - I*sqrt(4*I*c))/c) + (
-3*I*b^2*x^2 + 3*I*a^2)*log(1/2*sqrt(4*I*c)*e^(b*x + a) + 1) + (-3*I*b^2*x^
2 + 3*I*a^2)*log(-1/2*sqrt(4*I*c)*e^(b*x + a) + 1) + 6*I*polylog(3, 1/2*sqr
t(4*I*c)*e^(b*x + a)) + 6*I*polylog(3, -1/2*sqrt(4*I*c)*e^(b*x + a)))/b^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\frac{b\left(c^3+3ic^2-3c-i\right)\int\frac{x^2}{c^4e^{2a}e^{2bx}+3ic^3e^{2a}e^{2bx}+ic^3-3c^2e^{2a}e^{2bx}-3c^2-ice^{2a}e^{2bx}-3ic+1}\,dx}{2}+\frac{ix^2\log\left(1-\frac{i}{c+\frac{c}{e^{2a}e^{2bx}-1}+\frac{ce^ae^{bx}}{e^ae^{bx}-e^{-a}e^{-bx}}+\frac{i}{e^{2a}e^{2bx}-1}+\cdots}\right)\cdots}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c+(I+c)*coth(b*x+a)),x)
```

```
[Out] -b*(c**3 + 3*I*c**2 - 3*c - I)*Integral(x**2/(c**4*exp(2*a)*exp(2*b*x) + 3*
I*c**3*exp(2*a)*exp(2*b*x) + I*c**3 - 3*c**2*exp(2*a)*exp(2*b*x) - 3*c**2 -
 I*c*exp(2*a)*exp(2*b*x) - 3*I*c + 1), x)/2 + I*x**2*log(1 - I/(c + c/(exp(
2*a)*exp(2*b*x) - 1) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*
x)) + I/(exp(2*a)*exp(2*b*x) - 1) + I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - ex
p(-a)*exp(-b*x))))/4 - I*x**2*log(1 + I/(c + c/(exp(2*a)*exp(2*b*x) - 1) +
c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x)) + I/(exp(2*a)*exp(2
*b*x) - 1) + I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x))))/4
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left((c+i)\coth\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c+(I+c)*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot((c + I)*coth(b*x + a) + c), x)
```

3.211 $\int \cot^{-1}(c+(i+c)\coth(a+bx))\,dx$

Optimal. Leaf size=79

$$-\frac{i\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}-\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+x\cot^{-1}(c+(c+i)\coth(a+bx))+\frac{1}{2}ibx^2$$

```
[Out] (I/2)*b*x^2 + x*ArcCot[c + (I + c)*Coth[a + b*x]] - (I/2)*x*Log[1 - I*c*E^(
2*a + 2*b*x)] - ((I/4)*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b
```

Rubi [A] time = 0.123531, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {5190, 2184, 2190, 2279, 2391}

$$-\frac{i\text{PolyLog}\left(2,ice^{2a+2bx}\right)}{4b}-\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+x\cot^{-1}(c+(c+i)\coth(a+bx))+\frac{1}{2}ibx^2$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c + (I + c)*Coth[a + b*x]],x]
```

```
[Out] (I/2)*b*x^2 + x*ArcCot[c + (I + c)*Coth[a + b*x]] - (I/2)*x*Log[1 - I*c*E^(
2*a + 2*b*x)] - ((I/4)*PolyLog[2, I*c*E^(2*a + 2*b*x)])/b
```

Rule 5190

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)], x_Symbol] :> Simp[x*Arc
Cot[c + d*Coth[a + b*x]], x] + Dist[b, Int[x/(c - d - c*E^(2*a + 2*b*x)), x
], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c - d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \cot^{-1}(c+(i+c)\coth(a+bx))\,dx &= x\cot^{-1}(c+(i+c)\coth(a+bx))+b\int \frac{x}{-i-ce^{2a+2bx}}\,dx\\ &= \frac{1}{2}ibx^2+x\cot^{-1}(c+(i+c)\coth(a+bx))+(ibc)\int \frac{e^{2a+2bx}x}{-i-ce^{2a+2bx}}\,dx\\ &= \frac{1}{2}ibx^2+x\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+\frac{1}{2}i\int \log\left(1\right.\\ &= \frac{1}{2}ibx^2+x\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)+\frac{i\,\mathrm{Subst}\left(\int\right.}{}\\ &= \frac{1}{2}ibx^2+x\cot^{-1}(c+(i+c)\coth(a+bx))-\frac{1}{2}ix\log\left(1-ice^{2a+2bx}\right)-\frac{i\mathrm{Li}_2\left(ice^{2a+\right.}{4b}\end{aligned}$$

Mathematica [A] time = 0.623475, size = 71, normalized size = 0.9

$$x\cot^{-1}(c+(c+i)\coth(a+bx))-\frac{i\left(2bx\log\left(1+\frac{ie^{-2(a+bx)}}{c}\right)-\mathrm{PolyLog}\left(2,-\frac{ie^{-2(a+bx)}}{c}\right)\right)}{4b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[c + (I + c)*Coth[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (I + c)*Coth[a + b*x]] - ((I/4)*(2*b*x*Log[1 + I/(c*E^(2*(a +
b*x)))] - PolyLog[2, (-I)/(c*E^(2*(a + b*x)))]))/b
```

Maple [B] time = 0.121, size = 1381, normalized size = 17.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+(I+c)*coth(b*x+a)),x)
```

```
[Out] 1/2/(I+c)^2/b*ln(-1/2*I*(-c-(I+c)*coth(b*x+a)+I))*ln(c+(I+c)*coth(b*x+a)+I)
*c+1/(I+c)/b*arccot(c+(I+c)*coth(b*x+a))/(2*I+2*c)*ln(c+(I+c)*coth(b*x+a)+I
)*c^2-1/(I+c)/b*arccot(c+(I+c)*coth(b*x+a))/(2*I+2*c)*ln(c-(I+c)*coth(b*x+a
)+I)*c^2-1/2/(I+c)^2/b*dilog(-1/2*I*(c+(I+c)*coth(b*x+a)+I))*c-1/4/(I+c)^2/
b*ln(c+(I+c)*coth(b*x+a)+I)^2*c-1/2/(I+c)^2/b*dilog(-1/2*(-c-(I+c)*coth(b*x
+a)+I)/c)*c+1/2/(I+c)^2/b*dilog((-c-(I+c)*coth(b*x+a)-I)/(-2*I-2*c))*c-1/4*
I/(I+c)^2/b*dilog(-1/2*(-c-(I+c)*coth(b*x+a)+I)/c)+1/4*I/(I+c)^2/b*dilog((-
c-(I+c)*coth(b*x+a)-I)/(-2*I-2*c))-1/4*I/(I+c)^2/b*dilog(-1/2*I*(c+(I+c)*co
th(b*x+a)+I))-1/8*I/(I+c)^2/b*ln(c+(I+c)*coth(b*x+a)+I)^2+1/4*I/(I+c)^2/b*l
n(c-(I+c)*coth(b*x+a)+I)*ln(-1/2*(-c-(I+c)*coth(b*x+a)+I)/c)*c^2-1/4*I/(I+c
)^2/b*ln(c-(I+c)*coth(b*x+a)+I)*ln((-c-(I+c)*coth(b*x+a)-I)/(-2*I-2*c))*c^2
+1/4*I/(I+c)^2/b*ln(-1/2*I*(c+(I+c)*coth(b*x+a)+I))*ln(-1/2*I*(-c-(I+c)*cot
h(b*x+a)+I))*c^2-1/4*I/(I+c)^2/b*ln(-1/2*I*(-c-(I+c)*coth(b*x+a)+I))*ln(c+(
I+c)*coth(b*x+a)+I)*c^2+2*I/(I+c)/b*arccot(c+(I+c)*coth(b*x+a))/(2*I+2*c)*l
n(c+(I+c)*coth(b*x+a)+I)*c-2*I/(I+c)/b*arccot(c+(I+c)*coth(b*x+a))/(2*I+2*c
)*ln(c-(I+c)*coth(b*x+a)+I)*c-1/2/(I+c)^2/b*ln(c-(I+c)*coth(b*x+a)+I)*ln(-1
/2*(-c-(I+c)*coth(b*x+a)+I)/c)*c+1/2/(I+c)^2/b*ln(c-(I+c)*coth(b*x+a)+I)*ln
((-c-(I+c)*coth(b*x+a)-I)/(-2*I-2*c))*c-1/2/(I+c)^2/b*ln(-1/2*I*(c+(I+c)*co
th(b*x+a)+I))*ln(-1/2*I*(-c-(I+c)*coth(b*x+a)+I))*c-1/(I+c)/b*arccot(c+(I+c
)*coth(b*x+a))/(2*I+2*c)*ln(c+(I+c)*coth(b*x+a)+I)+1/(I+c)/b*arccot(c+(I+c)
*coth(b*x+a))/(2*I+2*c)*ln(c-(I+c)*coth(b*x+a)+I)-1/4*I/(I+c)^2/b*ln(-1/2*I
*(c+(I+c)*coth(b*x+a)+I))*ln(-1/2*I*(-c-(I+c)*coth(b*x+a)+I))+1/4*I/(I+c)^2
/b*ln(-1/2*I*(-c-(I+c)*coth(b*x+a)+I))*ln(c+(I+c)*coth(b*x+a)+I)-1/4*I/(I+c
)^2/b*ln(c-(I+c)*coth(b*x+a)+I)*ln(-1/2*(-c-(I+c)*coth(b*x+a)+I)/c)+1/4*I/(
I+c)^2/b*ln(c-(I+c)*coth(b*x+a)+I)*ln((-c-(I+c)*coth(b*x+a)-I)/(-2*I-2*c))+
1/4*I/(I+c)^2/b*dilog(-1/2*I*(c+(I+c)*coth(b*x+a)+I))*c^2+1/8*I/(I+c)^2/b*l
n(c+(I+c)*coth(b*x+a)+I)^2*c^2+1/4*I/(I+c)^2/b*dilog(-1/2*(-c-(I+c)*coth(b*
x+a)+I)/c)*c^2-1/4*I/(I+c)^2/b*dilog((-c-(I+c)*coth(b*x+a)-I)/(-2*I-2*c))*c
^2
```

Maxima [A] time = 5.90107, size = 108, normalized size = 1.37

$$-2\,b(c+i)\left(\frac{2\,x^2}{2i\,c-2}-\frac{2\,bx\log\left(-i\,ce^{(2\,bx+2\,a)}+1\right)+\mathrm{Li}_2\left(i\,ce^{(2\,bx+2\,a)}\right)}{-2\,b^2(-i\,c+1)}\right)+x\operatorname{arccot}\left((c+i)\coth\left(bx+a\right)+c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] -2*b*(c + I)*(2*x^2/(2*I*c - 2) - (2*b*x*log(-I*c*e^(2*b*x + 2*a) + 1) + di
log(I*c*e^(2*b*x + 2*a)))/(b^2*(2*I*c - 2))) + x*arccot((c + I)*coth(b*x +
a) + c)
```

Fricas [B] time = 2.21941, size = 512, normalized size = 6.48

$$\frac{i\,b^2x^2 + i\,bx\log\left(\frac{\left(ce^{(2\,bx+2\,a)}+i\right)e^{(-2\,bx-2\,a)}}{c+i}\right) - i\,a^2 + (-i\,bx - i\,a)\log\left(\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}+1\right) + (-i\,bx - i\,a)\log\left(-\frac{1}{2}\,\sqrt{4i\,c}e^{(bx+a)}+1\right.}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(I*b^2*x^2 + I*b*x*log((c*e^(2*b*x + 2*a) + I)*e^(-2*b*x - 2*a)/(c + I)
) - I*a^2 + (-I*b*x - I*a)*log(1/2*sqrt(4*I*c)*e^(b*x + a) + 1) + (-I*b*x -
 I*a)*log(-1/2*sqrt(4*I*c)*e^(b*x + a) + 1) + I*a*log(1/2*(2*c*e^(b*x + a)
+ I*sqrt(4*I*c))/c) + I*a*log(1/2*(2*c*e^(b*x + a) - I*sqrt(4*I*c))/c) - I*
dilog(1/2*sqrt(4*I*c)*e^(b*x + a)) - I*dilog(-1/2*sqrt(4*I*c)*e^(b*x + a)))
/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-b\left(c^3+3ic^2-3c-i\right)\int\frac{x}{c^4e^{2a}e^{2bx}+3ic^3e^{2a}e^{2bx}+ic^3-3c^2e^{2a}e^{2bx}-3c^2-ice^{2a}e^{2bx}-3ic+1}\,dx+\frac{ix\log\left(1-\frac{}{c+\frac{c}{e^{2a}e^{2bx}-1}+}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+(I+c)*coth(b*x+a)),x)
```

```
[Out] -b*(c**3 + 3*I*c**2 - 3*c - I)*Integral(x/(c**4*exp(2*a)*exp(2*b*x) + 3*I*c
**3*exp(2*a)*exp(2*b*x) + I*c**3 - 3*c**2*exp(2*a)*exp(2*b*x) - 3*c**2 - I*
c*exp(2*a)*exp(2*b*x) - 3*I*c + 1), x) + I*x*log(1 - I/(c + c/(exp(2*a)*exp
(2*b*x) - 1) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x)) + I/
```

```
(exp(2*a)*exp(2*b*x) - 1) + I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*ex
p(-b*x))))/2 - I*x*log(1 + I/(c + c/(exp(2*a)*exp(2*b*x) - 1) + c*exp(a)*ex
p(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x)) + I/(exp(2*a)*exp(2*b*x) - 1)
+ I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x))))/2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left((c+i)\coth\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot((c + I)*coth(b*x + a) + c), x)
```

3.212 $\int \frac{\cot^{-1}(c+(i+c)\coth(a+bx))}{x}\,dx$

Optimal. Leaf size=21

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c+(c+i)\coth(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c + (I + c)*Coth[a + b*x]]/x, x]
```

Rubi [A] time = 0.0825572, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\cot^{-1}(c+(i+c)\coth(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c + (I + c)*Coth[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c + (I + c)*Coth[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c+(i+c)\coth(a+bx))}{x}\,dx=\int \frac{\cot^{-1}(c+(i+c)\coth(a+bx))}{x}\,dx$$

Mathematica [A] time = 3.16182, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c+(i+c)\coth(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c + (I + c)*Coth[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c + (I + c)*Coth[a + b*x]]/x, x]
```

Maple [A] time = 0.441, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c+(i+c)\coth\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c+(I+c)*coth(b*x+a))/x,x)
```

```
[Out] int(arccot(c+(I+c)*coth(b*x+a))/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-i\,bx+\frac{1}{4}\left(-4i\,a+2\,\arctan\left(1,c\right)-i\,\log\left(c^2+1\right)\right)\log\left(x\right)-\frac{1}{2}\int\frac{\arctan\left(1,ce^{(2\,bx+2\,a)}\right)}{x}\,dx+\frac{1}{4}i\int\frac{\log\left(c^2e^{(4\,bx+4\,a)}+1\right)}{x}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*coth(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] -I*b*x + 1/4*(-4*I*a + 2*arctan2(1, c) - I*log(c^2 + 1))*log(x) - 1/2*integ
rate(arctan2(1, c*e^(2*b*x + 2*a))/x, x) + 1/4*I*integrate(log(c^2*e^(4*b*x
 + 4*a) + 1)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{i\,\log\left(\frac{\left(ce^{(2\,bx+2\,a)}+i\right)e^{(-2\,bx-2\,a)}}{c+i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*coth(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*I*log((c*e^(2*b*x + 2*a) + I)*e^(-2*b*x - 2*a)/(c + I))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c+(I+c)*coth(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left((c+i)\coth\left(bx+a\right)+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c+(I+c)*coth(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot((c + I)*coth(b*x + a) + c)/x, x)
```

3.213 $\int x^2 \cot^{-1}(c - (i - c)\coth(a + bx))\,dx$

Optimal. Leaf size=145

$$-\frac{ix\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{4b^2}+\frac{i\text{PolyLog}\left(4,-ice^{2a+2bx}\right)}{8b^3}+\frac{ix^2\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right)+\frac{1}{3}x^3\text{ c}$$

```
[Out] (-I/12)*b*x^4 + (x^3*ArcCot[c - (I - c)*Coth[a + b*x]])/3 + (I/6)*x^3*Log[1
 + I*c*E^(2*a + 2*b*x)] + ((I/4)*x^2*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b
- ((I/4)*x*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2 + ((I/8)*PolyLog[4, (-I)
*c*E^(2*a + 2*b*x)])/b^3
```

Rubi [A] time = 0.23172, antiderivative size = 145, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {5198, 2184, 2190, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{4b^2}+\frac{i\text{PolyLog}\left(4,-ice^{2a+2bx}\right)}{8b^3}+\frac{ix^2\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}+\frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right)+\frac{1}{3}x^3\text{ c}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[c - (I - c)*Coth[a + b*x]],x]
```

```
[Out] (-I/12)*b*x^4 + (x^3*ArcCot[c - (I - c)*Coth[a + b*x]])/3 + (I/6)*x^3*Log[1
 + I*c*E^(2*a + 2*b*x)] + ((I/4)*x^2*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b
- ((I/4)*x*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2 + ((I/8)*PolyLog[4, (-I)
*c*E^(2*a + 2*b*x)])/b^3
```

Rule 5198

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Coth[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d - c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
```

```
x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}(c-(i-c)\coth(a+bx))\,dx = \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) + \frac{1}{3}b\int \frac{x^3}{i-ce^{2a+2bx}}\,dx$$
$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) - \frac{1}{3}(ibc)\int \frac{e^{2a+2bx}x^3}{i-ce^{2a+2bx}}\,dx$$
$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) + \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) - \frac{1}{2}i\int$$
$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) + \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) + \frac{ix^2\mathrm{L}}{}$$
$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) + \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) + \frac{ix^2\mathrm{L}}{}$$
$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) + \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) + \frac{ix^2\mathrm{L}}{}$$
$$= -\frac{1}{12}ibx^4 + \frac{1}{3}x^3\cot^{-1}(c-(i-c)\coth(a+bx)) + \frac{1}{6}ix^3\log\left(1+ice^{2a+2bx}\right) + \frac{ix^2\mathrm{L}}{}$$

Mathematica [A] time = 0.196235, size = 128, normalized size = 0.88

$$\frac{i\left(-6b^2x^2\text{PolyLog}\left(2,\frac{ie^{-2(a+bx)}}{c}\right)-6bx\text{PolyLog}\left(3,\frac{ie^{-2(a+bx)}}{c}\right)-3\text{PolyLog}\left(4,\frac{ie^{-2(a+bx)}}{c}\right)+4b^3x^3\log\left(1-\frac{ie^{-2(a+bx)}}{c}\right)\right)}{24b^3}+\frac{1}{3}x^3\,\mathrm{c}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[c - (I - c)*Coth[a + b*x]],x]
```

```
[Out] (x^3*ArcCot[c + (-I + c)*Coth[a + b*x]])/3 + ((I/24)*(4*b^3*x^3*Log[1 - I/(
c*E^(2*(a + b*x)))] - 6*b^2*x^2*PolyLog[2, I/(c*E^(2*(a + b*x)))] - 6*b*x*P
olyLog[3, I/(c*E^(2*(a + b*x)))] - 3*PolyLog[4, I/(c*E^(2*(a + b*x)))]))/b^
3
```

Maple [C] time = 16.543, size = 1571, normalized size = 10.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(c-(I-c)*coth(b*x+a)),x)
```

```
[Out] -1/12*Pi*x^3*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^3-1/12*Pi*x^
3*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^2+1/3*Pi*x^3+1/2*I/b^3*
a^3*ln(1+I*exp(b*x+a)*(I*c)^(1/2))+1/2*I/b^3*a^3*ln(1-I*exp(b*x+a)*(I*c)^(1
/2))+1/2*I/b^3*a^2*dilog(1+I*exp(b*x+a)*(I*c)^(1/2))+1/2*I/b^3*a^2*dilog(1-
I*exp(b*x+a)*(I*c)^(1/2))-1/12*Pi*x^3*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x
+2*a)*c)/(exp(2*b*x+2*a)-1))^3-1/6*I*x^3*ln(-2*exp(2*b*x+2*a)*c+2*I)+1/12*I
*b*c/(I-c)*x^4+1/4*I/b^3*c/(I-c)*a^4+1/6*I*x^3*ln(2*I*exp(2*b*x+2*a)-2*exp(
2*b*x+2*a)*c)-1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c-2*I))*csgn(I*(2*exp(2*
b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^2+1/12*Pi*x^3*csgn(I*(-2*I*exp(2*b*x+2*
a)+2*exp(2*b*x+2*a)*c))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(ex
p(2*b*x+2*a)-1))^2+1/12*Pi*x^3*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)
*c)/(exp(2*b*x+2*a)-1))*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(
2*b*x+2*a)-1))+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*exp(2*b*x+2
*a)*c-2*I)/(exp(2*b*x+2*a)-1))^2-1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)-1))*csg
n(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/12*Pi*
x^3*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^3+1
/4*I*x^2*polylog(2,-I*c*exp(2*b*x+2*a))/b+1/8*I*polylog(4,-I*c*exp(2*b*x+2*
a))/b^3+1/3*I/b^2*c/(I-c)*x*a^3-1/3*I/b^3*c*a^3/(I-c)*ln(exp(b*x+a))-1/6*I/
b^3*a^3*ln(-exp(2*b*x+2*a)*c+I)+1/4/b^3/(I-c)*a^4+1/12*b/(I-c)*x^4+1/6*I*x^
3*ln(1+I*c*exp(2*b*x+2*a))-1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp
(2*b*x+2*a)-1))*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))-1/12*Pi*x
^3*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))*csgn((2*exp(2*b*x+2*
a)*c-2*I)/(exp(2*b*x+2*a)-1))^2+1/12*Pi*x^3*csgn(I*(-2*I*exp(2*b*x+2*a)+2*e
xp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+
2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/3*I/b^3*ln(1+I*c*exp(2*b*x+2*a))*a^3-1/4*I/
b^3*polylog(2,-I*c*exp(2*b*x+2*a))*a^2-1/2*I/b^2*ln(1+I*c*exp(2*b*x+2*a))*x
*a^2+1/2*I/b^2*a^2*ln(1+I*exp(b*x+a)*(I*c)^(1/2))*x+1/2*I/b^2*a^2*ln(1-I*ex
p(b*x+a)*(I*c)^(1/2))*x-1/3/b^3*a^3/(I-c)*ln(exp(b*x+a))+1/3/b^2/(I-c)*x*a^
3+1/12*Pi*x^3*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^3-1/12*Pi
*x^3*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/
4*I*x*polylog(3,-I*c*exp(2*b*x+2*a))/b^2+1/12*Pi*x^3*csgn(I/(exp(2*b*x+2*a)
-1))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c))*csgn(I*(-2*I*exp(2*b*
x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))-1/12*Pi*x^3*csgn(I/(exp(2*b*
x+2*a)-1))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)
/(exp(2*b*x+2*a)-1))
```

Maxima [A] time = 6.04091, size = 174, normalized size = 1.2

$$\frac{1}{3}x^3\operatorname{arccot}\left((c-i)\coth(bx+a)+c\right)+\frac{4}{9}\left(\frac{3x^4}{4ic+4}-\frac{4b^3x^3\log\left(ice^{(2bx+2a)}+1\right)+6b^2x^2\mathrm{Li}_2\left(-ice^{(2bx+2a)}\right)-6bx\mathrm{Li}_3(\cdots}{-2b^4(-ic-1)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(I-c)*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arccot((c - I)*coth(b*x + a) + c) + 4/9*(3*x^4/(4*I*c + 4) - (4*b^3
*x^3*log(I*c*e^(2*b*x + 2*a) + 1) + 6*b^2*x^2*dilog(-I*c*e^(2*b*x + 2*a)) -
 6*b*x*polylog(3, -I*c*e^(2*b*x + 2*a)) + 3*polylog(4, -I*c*e^(2*b*x + 2*a)
))/(b^4*(2*I*c + 2)))*b*(c - I)
```

Fricas [C] time = 2.19229, size = 867, normalized size = 5.98

$$-i\,b^4x^4 + 2i\,b^3x^3\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}-i}\right) + 6i\,b^2x^2\mathrm{Li}_2\left(\frac{1}{2}\sqrt{-4i\,c}e^{(bx+a)}\right) + 6i\,b^2x^2\mathrm{Li}_2\left(-\frac{1}{2}\sqrt{-4i\,c}e^{(bx+a)}\right) + i\,a^4 - 2i\,a^3\log\left(\frac{2\,ce^{(bx+a}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(I-c)*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(-I*b^4*x^4 + 2*I*b^3*x^3*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x + 2*
a) - I)) + 6*I*b^2*x^2*dilog(1/2*sqrt(-4*I*c)*e^(b*x + a)) + 6*I*b^2*x^2*di
log(-1/2*sqrt(-4*I*c)*e^(b*x + a)) + I*a^4 - 2*I*a^3*log(1/2*(2*c*e^(b*x +
a) + I*sqrt(-4*I*c))/c) - 2*I*a^3*log(1/2*(2*c*e^(b*x + a) - I*sqrt(-4*I*c)
)/c) - 12*I*b*x*polylog(3, 1/2*sqrt(-4*I*c)*e^(b*x + a)) - 12*I*b*x*polylog
(3, -1/2*sqrt(-4*I*c)*e^(b*x + a)) + (2*I*b^3*x^3 + 2*I*a^3)*log(1/2*sqrt(-
4*I*c)*e^(b*x + a) + 1) + (2*I*b^3*x^3 + 2*I*a^3)*log(-1/2*sqrt(-4*I*c)*e^(
b*x + a) + 1) + 12*I*polylog(4, 1/2*sqrt(-4*I*c)*e^(b*x + a)) + 12*I*polylo
g(4, -1/2*sqrt(-4*I*c)*e^(b*x + a)))/b^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(c-(I-c)*coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}((c-i)\coth(bx+a)+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(c-(I-c)*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot((c - I)*coth(b*x + a) + c), x)
```

3.214 $\int x \cot^{-1}(c-(i-c)\coth(a+bx))\,dx$

Optimal. Leaf size=116

$$-\frac{i\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{8b^2}+\frac{ix\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(-c+i)\coth(a+bx))$$

```
[Out] (-I/6)*b*x^3 + (x^2*ArcCot[c - (I - c)*Coth[a + b*x]])/2 + (I/4)*x^2*Log[1
+ I*c*E^(2*a + 2*b*x)] + ((I/4)*x*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b - (
(I/8)*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2
```

Rubi [A] time = 0.205318, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {5198, 2184, 2190, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,-ice^{2a+2bx}\right)}{8b^2}+\frac{ix\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}+\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{1}{2}x^2\cot^{-1}(c-(-c+i)\coth(a+bx))$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[c - (I - c)*Coth[a + b*x]],x]
```

```
[Out] (-I/6)*b*x^3 + (x^2*ArcCot[c - (I - c)*Coth[a + b*x]])/2 + (I/4)*x^2*Log[1
+ I*c*E^(2*a + 2*b*x)] + ((I/4)*x*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b - (
(I/8)*PolyLog[3, (-I)*c*E^(2*a + 2*b*x)])/b^2
```

Rule 5198

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)]*((e_.) + (f_.)*(x_))^(m_
.), x_Symbol] :> Simp[((e + f*x)^(m + 1)*ArcCot[c + d*Coth[a + b*x]])/(f*(m
 + 1)), x] + Dist[b/(f*(m + 1)), Int[(e + f*x)^(m + 1)/(c - d - c*E^(2*a +
2*b*x)), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[m, 0] && EqQ[(c - d
)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}\int x\cot^{-1}(c-(i-c)\coth(a+bx))\,dx &= \frac{1}{2}x^2\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{2}b\int\frac{x^2}{i-ce^{2a+2bx}}\,dx\\ &= -\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c-(i-c)\coth(a+bx))-\frac{1}{2}(ibc)\int\frac{e^{2a+2bx}x^2}{i-ce^{2a+2bx}}\,dx\\ &= -\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)-\frac{1}{2}i\int x\\ &= -\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{ix\mathrm{Li}_2(}{}\\ &= -\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{ix\mathrm{Li}_2(}{}\\ &= -\frac{1}{6}ibx^3+\frac{1}{2}x^2\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{4}ix^2\log\left(1+ice^{2a+2bx}\right)+\frac{ix\mathrm{Li}_2(}{}\end{aligned}$$

Mathematica [A] time = 0.115977, size = 102, normalized size = 0.88

$$\frac{i\left(-2bx\mathrm{PolyLog}\left(2,\frac{ie^{-2(a+bx)}}{c}\right)-\mathrm{PolyLog}\left(3,\frac{ie^{-2(a+bx)}}{c}\right)+2b^2x^2\log\left(1-\frac{ie^{-2(a+bx)}}{c}\right)\right)}{8b^2}+\frac{1}{2}x^2\cot^{-1}(c+(c-i)\coth(a+bx))$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[c - (I - c)*Coth[a + b*x]],x]
```

```
[Out] (x^2*ArcCot[c + (-I + c)*Coth[a + b*x]])/2 + ((I/8)*(2*b^2*x^2*Log[1 - I/(c
*E^(2*(a + b*x)))] - 2*b*x*PolyLog[2, I/(c*E^(2*(a + b*x)))] - PolyLog[3, I
/(c*E^(2*(a + b*x)))]))/b^2
```

Maple [C] time = 8.506, size = 1535, normalized size = 13.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(c-(I-c)*coth(b*x+a)),x)
```

```
[Out] 1/2*Pi*x^2-1/8*Pi*x^2*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^2-1
/3/b^2/(I-c)*a^3+1/6*b*x^3/(I-c)-1/2/b/(I-c)*x*a^2-1/8*Pi*x^2*csgn((-2*I*ex
p(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^3+1/2*I/b*ln(1+I*c*exp
```

```
(2*b*x+2*a))*x*a-1/2*I/b*a*ln(1+I*exp(b*x+a)*(I*c)^(1/2))*x-1/2*I/b*a*ln(1-
I*exp(b*x+a)*(I*c)^(1/2))*x-1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c-2*I))*csg
n(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^2-1/8*Pi*x^2*csgn((2*exp(2
*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^3+1/4*I/b^2*ln(1+I*c*exp(2*b*x+2*a))*a
^2+1/4*I/b^2*polylog(2,-I*c*exp(2*b*x+2*a))*a-1/2*I/b^2*a^2*ln(1+I*exp(b*x+
a)*(I*c)^(1/2))-1/2*I/b^2*a^2*ln(1-I*exp(b*x+a)*(I*c)^(1/2))-1/2*I/b^2*a*di
log(1+I*exp(b*x+a)*(I*c)^(1/2))-1/2*I/b^2*a*dilog(1-I*exp(b*x+a)*(I*c)^(1/2
))-1/8*I*polylog(3,-I*c*exp(2*b*x+2*a))/b^2-1/8*Pi*x^2*csgn((-2*I*exp(2*b*x
+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/4*I*x^2*ln(-2*exp(2*b*x+2
*a)*c+2*I)-1/3*I/b^2*c/(I-c)*a^3+1/6*I*b*c/(I-c)*x^3-1/2*I/b*c/(I-c)*x*a^2+
1/2*I/b^2*c*a^2/(I-c)*ln(exp(b*x+a))+1/4*I*x*polylog(2,-I*c*exp(2*b*x+2*a))
/b+1/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c))*csgn(I*(-2*I
*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2-1/8*Pi*x^2*csgn(I
*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))*csgn((2*exp(2*b*x+2*a)*c-2*I)
/(exp(2*b*x+2*a)-1))^2+1/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2
*a)*c)/(exp(2*b*x+2*a)-1))*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(e
xp(2*b*x+2*a)-1))^2+1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(2*exp(2*b
*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^2+1/4*I*x^2*ln(2*I*exp(2*b*x+2*a)-2*exp(
2*b*x+2*a)*c)-1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(-2*I*exp(2*b*x+
2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1))^2+1/4*I/b^2*a^2*ln(-exp(2*b*x+
2*a)*c+I)+1/4*I*x^2*ln(1+I*c*exp(2*b*x+2*a))-1/8*Pi*x^2*csgn(I/(exp(2*b*x+2
*a)-1))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I))*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(e
xp(2*b*x+2*a)-1))+1/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c
)/(exp(2*b*x+2*a)-1))*csgn((-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*
b*x+2*a)-1))-1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))
*csgn((2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))+1/2/b^2*a^2/(I-c)*ln(exp
(b*x+a))+1/8*Pi*x^2*csgn(I*(2*exp(2*b*x+2*a)*c-2*I)/(exp(2*b*x+2*a)-1))^3-1
/8*Pi*x^2*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x+2*a)-1
))^3+1/8*Pi*x^2*csgn(I/(exp(2*b*x+2*a)-1))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*ex
p(2*b*x+2*a)*c))*csgn(I*(-2*I*exp(2*b*x+2*a)+2*exp(2*b*x+2*a)*c)/(exp(2*b*x
+2*a)-1))
```

Maxima [A] time = 5.90224, size = 143, normalized size = 1.23

$$\left(\frac{2\,x^3}{3i\,c+3} - \frac{2\,b^2x^2\log\left(i\,ce^{(2\,bx+2\,a)}+1\right)+2\,bx\mathrm{Li}_2\left(-i\,ce^{(2\,bx+2\,a)}\right)-\mathrm{Li}_3(-i\,ce^{(2\,bx+2\,a)})}{-2\,b^3(-i\,c-1)}\right)b(c-i)+\frac{1}{2}\,x^2\,\mathrm{arccot}\left((c-i)\coth\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(I-c)*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] (2*x^3/(3*I*c + 3) - (2*b^2*x^2*log(I*c*e^(2*b*x + 2*a) + 1) + 2*b*x*dilog(
```

```
-I*c*e^(2*b*x + 2*a)) - polylog(3, -I*c*e^(2*b*x + 2*a)))/(b^3*(2*I*c + 2))
)*b*(c - I) + 1/2*x^2*arccot((c - I)*coth(b*x + a) + c)
```

Fricas [C] time = 2.26993, size = 717, normalized size = 6.18

$$\frac{-2i\,b^3x^3 + 3i\,b^2x^2\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}-i}\right) - 2i\,a^3 + 6i\,bx\mathrm{Li}_2\left(\frac{1}{2}\,\sqrt{-4i\,c}e^{(bx+a)}\right) + 6i\,bx\mathrm{Li}_2\left(-\frac{1}{2}\,\sqrt{-4i\,c}e^{(bx+a)}\right) + 3i\,a^2\log\left(\frac{2\,ce^{(bx+a)}+}{2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(I-c)*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/12*(-2*I*b^3*x^3 + 3*I*b^2*x^2*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x +
2*a) - I)) - 2*I*a^3 + 6*I*b*x*dilog(1/2*sqrt(-4*I*c)*e^(b*x + a)) + 6*I*b*
x*dilog(-1/2*sqrt(-4*I*c)*e^(b*x + a)) + 3*I*a^2*log(1/2*(2*c*e^(b*x + a) +
 I*sqrt(-4*I*c))/c) + 3*I*a^2*log(1/2*(2*c*e^(b*x + a) - I*sqrt(-4*I*c))/c)
 + (3*I*b^2*x^2 - 3*I*a^2)*log(1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) + (3*I*b^2
*x^2 - 3*I*a^2)*log(-1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) - 6*I*polylog(3, 1/2
*sqrt(-4*I*c)*e^(b*x + a)) - 6*I*polylog(3, -1/2*sqrt(-4*I*c)*e^(b*x + a)))
/b^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(c-(I-c)*coth(b*x+a)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left((c-i)\coth\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(c-(I-c)*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot((c - I)*coth(b*x + a) + c), x)
```

3.215 $\int \cot^{-1}(c-(i-c)\coth(a+bx))\,dx$

Optimal. Leaf size=82

$$\frac{i\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}+\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)+x\cot^{-1}(c-(-c+i)\coth(a+bx))-\frac{1}{2}ibx^2$$

```
[Out] (-I/2)*b*x^2 + x*ArcCot[c - (I - c)*Coth[a + b*x]] + (I/2)*x*Log[1 + I*c*E^
(2*a + 2*b*x)] + ((I/4)*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b
```

Rubi [A] time = 0.124294, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {5190, 2184, 2190, 2279, 2391}

$$\frac{i\text{PolyLog}\left(2,-ice^{2a+2bx}\right)}{4b}+\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)+x\cot^{-1}(c-(-c+i)\coth(a+bx))-\frac{1}{2}ibx^2$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[c - (I - c)*Coth[a + b*x]],x]
```

```
[Out] (-I/2)*b*x^2 + x*ArcCot[c - (I - c)*Coth[a + b*x]] + (I/2)*x*Log[1 + I*c*E^
(2*a + 2*b*x)] + ((I/4)*PolyLog[2, (-I)*c*E^(2*a + 2*b*x)])/b
```

Rule 5190

```
Int[ArcCot[(c_.) + Coth[(a_.) + (b_.)*(x_)]*(d_.)], x_Symbol] :> Simp[x*Arc
Cot[c + d*Coth[a + b*x]], x] + Dist[b, Int[x/(c - d - c*E^(2*a + 2*b*x)), x
], x] /; FreeQ[{a, b, c, d}, x] && EqQ[(c - d)^2, -1]
```

Rule 2184

```
Int[((c_.) + (d_.)*(x_))^(m_.)/((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x
_))))^(n_.)), x_Symbol] :> Simp[(c + d*x)^(m + 1)/(a*d*(m + 1)), x] - Dist[
b/a, Int[((c + d*x)^m*(F^(g*(e + f*x)))^n)/(a + b*(F^(g*(e + f*x)))^n), x],
 x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
```

```
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(c-(i-c)\coth(a+bx))\,dx = x\cot^{-1}(c-(i-c)\coth(a+bx))+b\int \frac{x}{i-ce^{2a+2bx}}\,dx$$
$$= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\coth(a+bx))-(ibc)\int \frac{e^{2a+2bx}x}{i-ce^{2a+2bx}}\,dx$$
$$= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)-\frac{1}{2}i\int \log\left(\right.$$
$$= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)-\frac{i\,\text{Subst}\left(\int\right.}{}$$
$$= -\frac{1}{2}ibx^2+x\cot^{-1}(c-(i-c)\coth(a+bx))+\frac{1}{2}ix\log\left(1+ice^{2a+2bx}\right)+\frac{i\text{Li}_2\left(-ice^{2}\right.}{4b}$$

Mathematica [A] time = 0.643599, size = 71, normalized size = 0.87

$$\frac{i\left(2bx\log\left(1-\frac{ie^{-2(a+bx)}}{c}\right)-\text{PolyLog}\left(2,\frac{ie^{-2(a+bx)}}{c}\right)\right)}{4b}+x\cot^{-1}(c+(c-i)\coth(a+bx))$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[c - (I - c)*Coth[a + b*x]],x]
```

```
[Out] x*ArcCot[c + (-I + c)*Coth[a + b*x]] + ((I/4)*(2*b*x*Log[1 - I/(c*E^(2*(a +
 b*x)))] - PolyLog[2, I/(c*E^(2*(a + b*x)))]))/b
```

Maple [B] time = 0.12, size = 1351, normalized size = 16.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c-(I-c)*coth(b*x+a)),x)
```

```
[Out] -1/b/(c-I)*arccot((c-I)*coth(b*x+a)+c)/(2*I-2*c)*ln((c-I)*coth(b*x+a)-c+I)+
1/4*I/b/(c-I)/(I-c)*ln(-1/2*I*((c-I)*coth(b*x+a)+c+I))*ln((c-I)*coth(b*x+a)
+c-I)-1/4*I/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)-c+I)*ln(1/2*((c-I)*coth(b*x+
a)+c+I)/c)-1/4*I/b/(c-I)/(I-c)*dilog(((c-I)*coth(b*x+a)+c-I)/(-2*I+2*c))*c^
2+1/4*I/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)-c+I)*ln(((c-I)*coth(b*x+a)+c-I)/
(-2*I+2*c))-1/4*I/b/(c-I)/(I-c)*dilog(-1/2*I*((c-I)*coth(b*x+a)+c+I))*c^2+1
/8*I/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)+c-I)^2*c^2+1/4*I/b/(c-I)/(I-c)*dilo
g(1/2*((c-I)*coth(b*x+a)+c+I)/c)*c^2-1/b/(c-I)*arccot((c-I)*coth(b*x+a)+c)/
(2*I-2*c)*ln((c-I)*coth(b*x+a)+c-I)*c^2-1/2/b/(c-I)/(I-c)*ln(-1/2*I*((c-I)*
coth(b*x+a)+c+I))*ln((c-I)*coth(b*x+a)+c-I)*c+1/2/b/(c-I)/(I-c)*ln((c-I)*co
th(b*x+a)-c+I)*ln(1/2*((c-I)*coth(b*x+a)+c+I)/c)*c-1/2/b/(c-I)/(I-c)*ln((c-
I)*coth(b*x+a)-c+I)*ln(((c-I)*coth(b*x+a)+c-I)/(-2*I+2*c))*c+1/b/(c-I)*arcc
ot((c-I)*coth(b*x+a)+c)/(2*I-2*c)*ln((c-I)*coth(b*x+a)-c+I)*c^2-1/4*I/b/(c-
I)/(I-c)*ln(-1/2*I*((c-I)*coth(b*x+a)+c+I))*ln((c-I)*coth(b*x+a)+c-I)*c^2+1
/4*I/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)-c+I)*ln(1/2*((c-I)*coth(b*x+a)+c+I)
/c)*c^2-1/4*I/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)-c+I)*ln(((c-I)*coth(b*x+a)
+c-I)/(-2*I+2*c))*c^2-2*I/b/(c-I)*arccot((c-I)*coth(b*x+a)+c)/(2*I-2*c)*ln(
(c-I)*coth(b*x+a)-c+I)*c+2*I/b/(c-I)*arccot((c-I)*coth(b*x+a)+c)/(2*I-2*c)*
ln((c-I)*coth(b*x+a)+c-I)*c+1/4/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)+c-I)^2*c
+1/2/b/(c-I)/(I-c)*dilog(1/2*((c-I)*coth(b*x+a)+c+I)/c)*c-1/2/b/(c-I)/(I-c)
*dilog(((c-I)*coth(b*x+a)+c-I)/(-2*I+2*c))*c-1/2/b/(c-I)/(I-c)*dilog(-1/2*I
*((c-I)*coth(b*x+a)+c+I))*c+1/b/(c-I)*arccot((c-I)*coth(b*x+a)+c)/(2*I-2*c)
*ln((c-I)*coth(b*x+a)+c-I)-1/8*I/b/(c-I)/(I-c)*ln((c-I)*coth(b*x+a)+c-I)^2-
1/4*I/b/(c-I)/(I-c)*dilog(1/2*((c-I)*coth(b*x+a)+c+I)/c)+1/4*I/b/(c-I)/(I-c
)*dilog(((c-I)*coth(b*x+a)+c-I)/(-2*I+2*c))+1/4*I/b/(c-I)/(I-c)*dilog(-1/2*
I*((c-I)*coth(b*x+a)+c+I))
```

Maxima [A] time = 5.90343, size = 108, normalized size = 1.32

$$2\,b(c-i)\left(\frac{2\,x^2}{2i\,c+2}-\frac{2\,bx\log\left(i\,ce^{(2\,bx+2\,a)}+1\right)+\mathrm{Li}_2\left(-i\,ce^{(2\,bx+2\,a)}\right)}{-2\,b^2(-i\,c-1)}\right)+x\,\mathrm{arccot}\left((c-i)\coth\left(bx+a\right)+c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*coth(b*x+a)),x, algorithm="maxima")
```

```
[Out] 2*b*(c - I)*(2*x^2/(2*I*c + 2) - (2*b*x*log(I*c*e^(2*b*x + 2*a) + 1) + dilo
g(-I*c*e^(2*b*x + 2*a)))/(b^2*(2*I*c + 2))) + x*arccot((c - I)*coth(b*x + a
) + c)
```

Fricas [B] time = 2.17169, size = 517, normalized size = 6.3

$$\frac{-i\,b^2x^2 + i\,bx\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}-i}\right) + i\,a^2 + (i\,bx + i\,a)\log\left(\frac{1}{2}\,\sqrt{-4i\,c}e^{(bx+a)} + 1\right) + (i\,bx + i\,a)\log\left(-\frac{1}{2}\,\sqrt{-4i\,c}e^{(bx+a)} + 1\right) - i\,a}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*coth(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(-I*b^2*x^2 + I*b*x*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x + 2*a) - I)
) + I*a^2 + (I*b*x + I*a)*log(1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) + (I*b*x +
I*a)*log(-1/2*sqrt(-4*I*c)*e^(b*x + a) + 1) - I*a*log(1/2*(2*c*e^(b*x + a)
+ I*sqrt(-4*I*c))/c) - I*a*log(1/2*(2*c*e^(b*x + a) - I*sqrt(-4*I*c))/c) +
I*dilog(1/2*sqrt(-4*I*c)*e^(b*x + a)) + I*dilog(-1/2*sqrt(-4*I*c)*e^(b*x +
a)))/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-b\left(c^6 - 6ic^5 - 15c^4 + 20ic^3 + 15c^2 - 6ic - 1\right)\int \frac{x}{c^7e^{2a}e^{2bx} - 6ic^6e^{2a}e^{2bx} - ic^6 - 15c^5e^{2a}e^{2bx} - 6c^5 + 20ic^4e^{2a}e^{2bx} + 15ic^4 +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c-(I-c)*coth(b*x+a)),x)
```

```
[Out] -b*(c**6 - 6*I*c**5 - 15*c**4 + 20*I*c**3 + 15*c**2 - 6*I*c - 1)*Integral(x
/(c**7*exp(2*a)*exp(2*b*x) - 6*I*c**6*exp(2*a)*exp(2*b*x) - I*c**6 - 15*c**
5*exp(2*a)*exp(2*b*x) - 6*c**5 + 20*I*c**4*exp(2*a)*exp(2*b*x) + 15*I*c**4
+ 15*c**3*exp(2*a)*exp(2*b*x) + 20*c**3 - 6*I*c**2*exp(2*a)*exp(2*b*x) - 15
*I*c**2 - c*exp(2*a)*exp(2*b*x) - 6*c + I), x) + I*x*log(1 - I/(c + c/(exp(
2*a)*exp(2*b*x) - 1) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*
```

```
x)) - I/(exp(2*a)*exp(2*b*x) - 1) - I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - ex
p(-a)*exp(-b*x))))/2 - (I*c*x + x)*log(1 + I/(c + c/(exp(2*a)*exp(2*b*x) -
1) + c*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x)) - I/(exp(2*a)*
exp(2*b*x) - 1) - I*exp(a)*exp(b*x)/(exp(a)*exp(b*x) - exp(-a)*exp(-b*x))))
/(2*c - 2*I)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left((c-i)\coth\left(bx+a\right)+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*coth(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot((c - I)*coth(b*x + a) + c), x)
```

3.216 $\int \frac{\cot^{-1}(c-(i-c)\coth(a+bx))}{x}\,dx$

Optimal. Leaf size=24

$$\text{CannotIntegrate}\left(\frac{\cot^{-1}(c-(-c+i)\coth(a+bx))}{x},x\right)$$

```
[Out] CannotIntegrate[ArcCot[c - (I - c)*Coth[a + b*x]]/x, x]
```

Rubi [A] time = 0.108297, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{\cot^{-1}(c-(i-c)\coth(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcCot[c - (I - c)*Coth[a + b*x]]/x,x]
```

```
[Out] Defer[Int][ArcCot[c - (I - c)*Coth[a + b*x]]/x, x]
```

Rubi steps

$$\int \frac{\cot^{-1}(c-(i-c)\coth(a+bx))}{x}\,dx = \int \frac{\cot^{-1}(c-(i-c)\coth(a+bx))}{x}\,dx$$

Mathematica [A] time = 3.08878, size = 0, normalized size = 0.

$$\int \frac{\cot^{-1}(c-(i-c)\coth(a+bx))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcCot[c - (I - c)*Coth[a + b*x]]/x,x]
```

```
[Out] Integrate[ArcCot[c - (I - c)*Coth[a + b*x]]/x, x]
```

Maple [A] time = 0.424, size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}\left(c-(i-c)\coth\left(bx+a\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(c-(I-c)*coth(b*x+a))/x,x)
```

```
[Out] int(arccot(c-(I-c)*coth(b*x+a))/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$i\,bx-\frac{1}{4}\left(-4i\,a+2\,\arctan\left(1,-c\right)-i\,\log\left(c^2+1\right)\right)\log\left(x\right)+\frac{1}{2}\int\frac{\arctan\left(1,-ce^{(2\,bx+2\,a)}\right)}{x}\,dx-\frac{1}{4}i\int\frac{\log\left(c^2e^{(4\,bx+4\,a)}+1\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*coth(b*x+a))/x,x, algorithm="maxima")
```

```
[Out] I*b*x - 1/4*(-4*I*a + 2*arctan2(1, -c) - I*log(c^2 + 1))*log(x) + 1/2*integ
rate(arctan2(1, -c*e^(2*b*x + 2*a))/x, x) - 1/4*I*integrate(log(c^2*e^(4*b*
x + 4*a) + 1)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{i\,\log\left(\frac{(c-i)e^{(2\,bx+2\,a)}}{ce^{(2\,bx+2\,a)}-i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*coth(b*x+a))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*I*log((c - I)*e^(2*b*x + 2*a)/(c*e^(2*b*x + 2*a) - I))/x, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(c-(I-c)*coth(b*x+a))/x,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\operatorname{arccot}((c-i)\coth(bx+a)+c)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(c-(I-c)*coth(b*x+a))/x,x, algorithm="giac")
```

```
[Out] integrate(arccot((c - I)*coth(b*x + a) + c)/x, x)
```

3.217 $\int \frac{(a+b\cot^{-1}(cx^n))(d+e\log(fx^m))}{x}\,dx$

Optimal. Leaf size=187

$$-\frac{ibd\text{PolyLog}\left(2,-\frac{ix^{-n}}{c}\right)}{2n}+\frac{ibd\text{PolyLog}\left(2,\frac{ix^{-n}}{c}\right)}{2n}-\frac{ibe\log\left(fx^m\right)\text{PolyLog}\left(2,-\frac{ix^{-n}}{c}\right)}{2n}+\frac{ibe\log\left(fx^m\right)\text{PolyLog}\left(2,\frac{ix^{-n}}{c}\right)}{2n}$$

```
[Out] a*d*Log[x] + (a*e*Log[f*x^m]^2)/(2*m) - ((I/2)*b*d*PolyLog[2, (-I)/(c*x^n)]
)/n - ((I/2)*b*e*Log[f*x^m]*PolyLog[2, (-I)/(c*x^n)])/n + ((I/2)*b*d*PolyLo
g[2, I/(c*x^n)])/n + ((I/2)*b*e*Log[f*x^m]*PolyLog[2, I/(c*x^n)])/n - ((I/2
)*b*e*m*PolyLog[3, (-I)/(c*x^n)])/n^2 + ((I/2)*b*e*m*PolyLog[3, I/(c*x^n)])
/n^2
```

Rubi [A] time = 0.607913, antiderivative size = 187, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2301, 6742, 5032, 4849, 2391, 5008, 5006, 2374, 6589}

$$-\frac{ibd\text{PolyLog}\left(2,-\frac{ix^{-n}}{c}\right)}{2n}+\frac{ibd\text{PolyLog}\left(2,\frac{ix^{-n}}{c}\right)}{2n}-\frac{ibe\log\left(fx^m\right)\text{PolyLog}\left(2,-\frac{ix^{-n}}{c}\right)}{2n}+\frac{ibe\log\left(fx^m\right)\text{PolyLog}\left(2,\frac{ix^{-n}}{c}\right)}{2n}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcCot[c*x^n])*(d + e*Log[f*x^m]))/x,x]
```

```
[Out] a*d*Log[x] + (a*e*Log[f*x^m]^2)/(2*m) - ((I/2)*b*d*PolyLog[2, (-I)/(c*x^n)]
)/n - ((I/2)*b*e*Log[f*x^m]*PolyLog[2, (-I)/(c*x^n)])/n + ((I/2)*b*d*PolyLo
g[2, I/(c*x^n)])/n + ((I/2)*b*e*Log[f*x^m]*PolyLog[2, I/(c*x^n)])/n - ((I/2
)*b*e*m*PolyLog[3, (-I)/(c*x^n)])/n^2 + ((I/2)*b*e*m*PolyLog[3, I/(c*x^n)])
/n^2
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 5032

```
Int[((a_.) + ArcCot[(c_.)*(x_)^(n_)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1
/n, Subst[Int[(a + b*ArcCot[c*x])^p/x, x], x, x^n], x] /; FreeQ[{a, b, c, n
}, x] && IGtQ[p, 0]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 5008

```
Int[(Log[(d_.)*(x_)^(m_.)]*(ArcCot[(c_.)*(x_)^(n_.)]*(b_.) + (a_)))/(x_), x
_Symbol] :> Dist[a, Int[Log[d*x^m]/x, x], x] + Dist[b, Int[(Log[d*x^m]*ArcC
ot[c*x^n])/x, x], x] /; FreeQ[{a, b, c, d, m, n}, x]
```

Rule 5006

```
Int[(ArcCot[(c_.)*(x_)^(n_.)]*Log[(d_.)*(x_)^(m_.)])/(x_), x_Symbol] :> Dis
t[I/2, Int[(Log[d*x^m]*Log[1 - I/(c*x^n)])/x, x], x] - Dist[I/2, Int[(Log[d
*x^m]*Log[1 + I/(c*x^n)])/x, x], x] /; FreeQ[{c, d, m, n}, x]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\cot^{-1}(cx^n)\right)\left(d+e\log\left(fx^m\right)\right)}{x}\,dx = \int \left(\frac{d\left(a+b\cot^{-1}(cx^n)\right)}{x}+\frac{e\left(a+b\cot^{-1}(cx^n)\right)\log\left(fx^m\right)}{x}\right)dx$$

$$= d\int \frac{a+b\cot^{-1}(cx^n)}{x}\,dx + e\int \frac{\left(a+b\cot^{-1}(cx^n)\right)\log\left(fx^m\right)}{x}\,dx$$

$$= (ae)\int \frac{\log\left(fx^m\right)}{x}\,dx + (be)\int \frac{\cot^{-1}(cx^n)\log\left(fx^m\right)}{x}\,dx + \frac{d\,\mathrm{Subst}\left(\int \frac{a+b\,\mathrm{co}}{}\right.}{n}$$

$$= ad\log(x) + \frac{ae\log^2\left(fx^m\right)}{2m} + \frac{1}{2}(ibe)\int \frac{\log\left(fx^m\right)\log\left(1-\frac{ix^{-n}}{c}\right)}{x}\,dx - \frac{1}{2}(ibe)$$

$$= ad\log(x) + \frac{ae\log^2\left(fx^m\right)}{2m} - \frac{ibd\mathrm{Li}_2\left(-\frac{ix^{-n}}{c}\right)}{2n} - \frac{ibe\log\left(fx^m\right)\mathrm{Li}_2\left(-\frac{ix^{-n}}{c}\right)}{2n} + \cdots$$

$$= ad\log(x) + \frac{ae\log^2\left(fx^m\right)}{2m} - \frac{ibd\mathrm{Li}_2\left(-\frac{ix^{-n}}{c}\right)}{2n} - \frac{ibe\log\left(fx^m\right)\mathrm{Li}_2\left(-\frac{ix^{-n}}{c}\right)}{2n} + \cdots$$

Mathematica [C] time = 0.335828, size = 132, normalized size = 0.71

$$-\frac{bcx^n\left(d+e\log\left(fx^m\right)\right)\mathrm{HypergeometricPFQ}\left(\left\{\frac{1}{2},\frac{1}{2},1\right\},\left\{\frac{3}{2},\frac{3}{2}\right\},-c^2x^{2n}\right)}{n} + \frac{bcemx^n\mathrm{HypergeometricPFQ}\left(\left\{\frac{1}{2},\frac{1}{2},\frac{1}{2},1\right.\right.}{n^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*ArcCot[c*x^n])*(d + e*Log[f*x^m]))/x,x]
```

```
[Out] (b*c*e*m*x^n*HypergeometricPFQ[{1/2, 1/2, 1/2, 1}, {3/2, 3/2, 3/2}, -(c^2*x
^(2*n))])/n^2 - (b*c*x^n*HypergeometricPFQ[{1/2, 1/2, 1}, {3/2, 3/2}, -(c^2
*x^(2*n))]*(d + e*Log[f*x^m]))/n - ((a + b*ArcCot[c*x^n] + b*ArcTan[c*x^n])
*Log[x]*(e*m*Log[x] - 2*(d + e*Log[f*x^m])))/2
```

Maple [C] time = 0.371, size = 1058, normalized size = 5.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arccot(c*x^n))*(d+e*ln(f*x^m))/x,x)
```

```
[Out] 1/4*I/n*Pi^2*ln(x^n)*b*e*csgn(I*x^m)*csgn(I*f*x^m)^2+1/4*e/m*ln(x^m)^2*b*Pi
+1/2/n*Pi*ln(x^n)*b*d-1/2*I/n*Pi*ln(x^n)*a*e*csgn(I*x^m)*csgn(I*f*x^m)*csgn
(I*f)+1/2*I/n*dilog(1-I*c*x^n)*b*d-1/2*I/n*dilog(1+I*c*x^n)*b*d+1/2*I*e*b*l
n(-I*(c*x^n+I))*ln(x^m)*ln(x)+1/2*I/n*ln(f)*dilog(1-I*c*x^n)*b*e+1/n*ln(f)*
ln(x^n)*a*e-1/2*I/n*ln(f)*dilog(1+I*c*x^n)*b*e+1/2/n*Pi*ln(f)*ln(x^n)*b*e-1
/2*I*e*b/n*m*ln(x)*polylog(2,-I*c*x^n)+1/2*I*e*b/n*ln(-I*(-c*x^n+I))*ln(-I*
c*x^n)*ln(x^m)-1/2*I*e*b/n*dilog(-I*c*x^n)*m*ln(x)+1/2*I*e*b/n*dilog(-I*(c*
x^n+I))*ln(x^m)-1/2*I*e*b*ln(-I*(c*x^n+I))*ln(x)^2*m-1/2*I*e*b/n*dilog(-I*(
c*x^n+I))*m*ln(x)+1/4/n*Pi*dilog(1-I*c*x^n)*b*e*csgn(I*x^m)*csgn(I*f*x^m)*c
sgn(I*f)-1/4/n*Pi*dilog(1+I*c*x^n)*b*e*csgn(I*x^m)*csgn(I*f*x^m)*csgn(I*f)+
1/2*I/n*Pi*ln(x^n)*a*e*csgn(I*f*x^m)^2*csgn(I*f)+1/2*I/n*Pi*ln(x^n)*a*e*csg
n(I*x^m)*csgn(I*f*x^m)^2+1/4*I/n*Pi^2*ln(x^n)*b*e*csgn(I*f*x^m)^2*csgn(I*f)
-1/2*I*e*b/n*ln(-I*(-c*x^n+I))*ln(-I*c*x^n)*m*ln(x)+1/2*I*e*b/n*dilog(-I*c*
x^n)*ln(x^m)+1/2*I*e*b/n*m*ln(x)*polylog(2,I*c*x^n)-1/2*I*e*b/n^2*m*polylog
(3,I*c*x^n)+1/2*e*a/m*ln(x^m)^2+1/n*ln(x^n)*a*d-1/2*I/n*Pi*ln(x^n)*a*e*csgn
(I*f*x^m)^3+1/4/n*Pi*dilog(1+I*c*x^n)*b*e*csgn(I*x^m)*csgn(I*f*x^m)^2-1/4/n
*Pi*dilog(1-I*c*x^n)*b*e*csgn(I*x^m)*csgn(I*f*x^m)^2+1/4/n*Pi*dilog(1-I*c*x
^n)*b*e*csgn(I*f*x^m)^3-1/2*I*e*b*ln(1+I*c*x^n)*ln(x)^2*m+1/2*I*e*b*ln(1+I*
c*x^n)*ln(x^m)*ln(x)+1/2*I*e*b/n^2*m*polylog(3,-I*c*x^n)+1/2*I*e*b*ln(1-I*c
*x^n)*ln(x)^2*m-1/2*I*e*b*ln(1-I*c*x^n)*ln(x^m)*ln(x)+1/2*I*e*b*ln(-I*(-c*x
^n+I))*ln(x)^2*m-1/2*I*e*b*ln(-I*(-c*x^n+I))*ln(x^m)*ln(x)-1/4/n*Pi*dilog(1
+I*c*x^n)*b*e*csgn(I*f*x^m)^3-1/4*I/n*Pi^2*ln(x^n)*b*e*csgn(I*f*x^m)^3-1/4/
n*Pi*dilog(1-I*c*x^n)*b*e*csgn(I*f*x^m)^2*csgn(I*f)+1/4/n*Pi*dilog(1+I*c*x^
n)*b*e*csgn(I*f*x^m)^2*csgn(I*f)-1/4*I/n*Pi^2*ln(x^n)*b*e*csgn(I*x^m)*csgn(
I*f*x^m)*csgn(I*f)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,bem\arctan\left(1,cx^{n}\right)\log\left(x\right)^{2}+be\arctan\left(1,cx^{n}\right)\log\left(x\right)\log\left(x^{m}\right)+\frac{ae\log\left(fx^{m}\right)^{2}}{2\,m}+ad\log\left(x\right)+\left(be\arctan\left(1,cx^{n}\right)\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(c*x^n))*(d+e*log(f*x^m))/x,x, algorithm="maxima")
```

```
[Out] -1/2*b*e*m*arctan2(1, c*x^n)*log(x)^2 + b*e*arctan2(1, c*x^n)*log(x)*log(x^
m) + 1/2*a*e*log(f*x^m)^2/m + a*d*log(x) + (b*e*arctan2(1, c*x^n)*log(f) +
b*d*arctan2(1, c*x^n))*log(x) + integrate(-1/2*(b*c*e*m*n*x^n*log(x)^2 - 2*
b*c*e*n*x^n*log(x)*log(x^m) - 2*(b*c*e*log(f) + b*c*d)*n*x^n*log(x))/(c^2*x
*x^(2*n) + x), x)
```

Fricas [C] time = 2.40855, size = 711, normalized size = 3.8

$$\frac{2\,aemn^2\log(x)^2 - 2i\,bem\mathrm{polylog}(3, i\,cx^n) + 2i\,bem\mathrm{polylog}(3, -i\,cx^n) + 2\left(bemn^2\log(x)^2 + 2\left(ben^2\log\left(f\right) + bdn^2\right)\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(c*x^n))*(d+e*log(f*x^m))/x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*e*m*n^2*log(x)^2 - 2*I*b*e*m*polylog(3, I*c*x^n) + 2*I*b*e*m*polyl
og(3, -I*c*x^n) + 2*(b*e*m*n^2*log(x)^2 + 2*(b*e*n^2*log(f) + b*d*n^2)*log(
x))*arccot(c*x^n) + (2*I*b*e*m*n*log(x) + 2*I*b*e*n*log(f) + 2*I*b*d*n)*dil
og(I*c*x^n) + (-2*I*b*e*m*n*log(x) - 2*I*b*e*n*log(f) - 2*I*b*d*n)*dilog(-I
*c*x^n) + (-I*b*e*m*n^2*log(x)^2 + (-2*I*b*e*n^2*log(f) - 2*I*b*d*n^2)*log(
x))*log(I*c*x^n + 1) + (I*b*e*m*n^2*log(x)^2 + (2*I*b*e*n^2*log(f) + 2*I*b*
d*n^2)*log(x))*log(-I*c*x^n + 1) + 4*(a*e*n^2*log(f) + a*d*n^2)*log(x))/n^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*acot(c*x**n))*(d+e*ln(f*x**m))/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\operatorname{arccot}(cx^n) + a)\left(e\log\left(fx^m\right) + d\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arccot(c*x^n))*(d+e*log(f*x^m))/x,x, algorithm="giac")
```

```
[Out] integrate((b*arccot(c*x^n) + a)*(e*log(f*x^m) + d)/x, x)
```

3.218 $\int \cot^{-1}(e^x)\,dx$

Optimal. Leaf size=35

$$\frac{1}{2}i\text{PolyLog}\left(2,ie^{-x}\right)-\frac{1}{2}i\text{PolyLog}\left(2,-ie^{-x}\right)$$

```
[Out] (-I/2)*PolyLog[2, (-I)/E^x] + (I/2)*PolyLog[2, I/E^x]
```

Rubi [A] time = 0.0284399, antiderivative size = 35, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 4, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.75, Rules used = {2282, 4849, 2391}

$$\frac{1}{2}i\text{PolyLog}\left(2,ie^{-x}\right)-\frac{1}{2}i\text{PolyLog}\left(2,-ie^{-x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[E^x],x]
```

```
[Out] (-I/2)*PolyLog[2, (-I)/E^x] + (I/2)*PolyLog[2, I/E^x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}(e^x)\,dx = \text{Subst}\left(\int \frac{\cot^{-1}(x)}{x}\,dx, x, e^x\right)$$
$$= \frac{1}{2}i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x}\,dx, x, e^x\right) - \frac{1}{2}i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x}\,dx, x, e^x\right)$$
$$= -\frac{1}{2}i\text{Li}_2\left(-ie^{-x}\right) + \frac{1}{2}i\text{Li}_2\left(ie^{-x}\right)$$

Mathematica [A] time = 0.0334939, size = 59, normalized size = 1.69

$$x\cot^{-1}(e^x) + \frac{1}{2}i\left(-\text{PolyLog}(2,-ie^x) + \text{PolyLog}(2,ie^x) + x(\log(1-ie^x) - \log(1+ie^x))\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[E^x],x]
```

```
[Out] x*ArcCot[E^x] + (I/2)*(x*(Log[1 - I*E^x] - Log[1 + I*E^x]) - PolyLog[2, (-I
)*E^x] + PolyLog[2, I*E^x])
```

Maple [B] time = 0.033, size = 59, normalized size = 1.7

$$\ln(e^x)\,\text{arccot}(e^x) - \frac{i}{2}\ln(e^x)\ln(1+ie^x) + \frac{i}{2}\ln(e^x)\ln(1-ie^x) - \frac{i}{2}\text{dilog}(1+ie^x) + \frac{i}{2}\text{dilog}(1-ie^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(exp(x)),x)
```

```
[Out] ln(exp(x))*arccot(exp(x))-1/2*I*ln(exp(x))*ln(1+I*exp(x))+1/2*I*ln(exp(x))*
ln(1-I*exp(x))-1/2*I*dilog(1+I*exp(x))+1/2*I*dilog(1-I*exp(x))
```

Maxima [A] time = 1.61049, size = 46, normalized size = 1.31

$$x\,\text{arccot}(e^x) + \frac{1}{4}\pi\log\left(e^{(2x)}+1\right) + \frac{1}{2}i\,\text{Li}_2(i\,e^x+1) - \frac{1}{2}i\,\text{Li}_2(-i\,e^x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(x)),x, algorithm="maxima")
```

```
[Out] x*arccot(e^x) + 1/4*pi*log(e^(2*x) + 1) + 1/2*I*dilog(I*e^x + 1) - 1/2*I*di
log(-I*e^x + 1)
```

Fricas [B] time = 2.15755, size = 147, normalized size = 4.2

$$x \operatorname{arccot}(e^x) - \frac{1}{2} i x \log(i e^x + 1) + \frac{1}{2} i x \log(-i e^x + 1) + \frac{1}{2} i \operatorname{Li}_2(i e^x) - \frac{1}{2} i \operatorname{Li}_2(-i e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(x)),x, algorithm="fricas")
```

```
[Out] x*arccot(e^x) - 1/2*I*x*log(I*e^x + 1) + 1/2*I*x*log(-I*e^x + 1) + 1/2*I*di
log(I*e^x) - 1/2*I*dilog(-I*e^x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}(e^x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(exp(x)),x)
```

```
[Out] Integral(acot(exp(x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}(e^x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(x)),x, algorithm="giac")
```

```
[Out] integrate(arccot(e^x), x)
```

3.219 $\int x \cot^{-1}(e^x)\, dx$

Optimal. Leaf size=71

$$-\frac{1}{2}ix\text{PolyLog}\left(2,-ie^{-x}\right)+\frac{1}{2}ix\text{PolyLog}\left(2,ie^{-x}\right)-\frac{1}{2}i\text{PolyLog}\left(3,-ie^{-x}\right)+\frac{1}{2}i\text{PolyLog}\left(3,ie^{-x}\right)$$

```
[Out] (-I/2)*x*PolyLog[2, (-I)/E^x] + (I/2)*x*PolyLog[2, I/E^x] - (I/2)*PolyLog[3
, (-I)/E^x] + (I/2)*PolyLog[3, I/E^x]
```

Rubi [A] time = 0.0465794, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 6, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {5144, 2531, 2282, 6589}

$$-\frac{1}{2}ix\text{PolyLog}\left(2,-ie^{-x}\right)+\frac{1}{2}ix\text{PolyLog}\left(2,ie^{-x}\right)-\frac{1}{2}i\text{PolyLog}\left(3,-ie^{-x}\right)+\frac{1}{2}i\text{PolyLog}\left(3,ie^{-x}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[E^x],x]
```

```
[Out] (-I/2)*x*PolyLog[2, (-I)/E^x] + (I/2)*x*PolyLog[2, I/E^x] - (I/2)*PolyLog[3
, (-I)/E^x] + (I/2)*PolyLog[3, I/E^x]
```

Rule 5144

```
Int[ArcCot[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I/(a + b*f^(c + d*x))], x], x] - Dist[I/2, Int[
x^m*Log[1 + I/(a + b*f^(c + d*x))], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
```

```
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int x\cot^{-1}(e^x)\,dx &= \frac{1}{2}i\int x\log\left(1-ie^{-x}\right)\,dx-\frac{1}{2}i\int x\log\left(1+ie^{-x}\right)\,dx\\
&= -\frac{1}{2}ix\text{Li}_2\left(-ie^{-x}\right)+\frac{1}{2}ix\text{Li}_2\left(ie^{-x}\right)+\frac{1}{2}i\int\text{Li}_2\left(-ie^{-x}\right)\,dx-\frac{1}{2}i\int\text{Li}_2\left(ie^{-x}\right)\,dx\\
&= -\frac{1}{2}ix\text{Li}_2\left(-ie^{-x}\right)+\frac{1}{2}ix\text{Li}_2\left(ie^{-x}\right)-\frac{1}{2}i\,\text{Subst}\left(\int\frac{\text{Li}_2(-ix)}{x}\,dx,x,e^{-x}\right)+\frac{1}{2}i\,\text{Subst}\left(\int\frac{\text{Li}_2(ix)}{x}\,dx,x,e^{-x}\right)\\
&= -\frac{1}{2}ix\text{Li}_2\left(-ie^{-x}\right)+\frac{1}{2}ix\text{Li}_2\left(ie^{-x}\right)-\frac{1}{2}i\text{Li}_3\left(-ie^{-x}\right)+\frac{1}{2}i\text{Li}_3\left(ie^{-x}\right)
\end{aligned}$$

Mathematica [A] time = 0.0104373, size = 58, normalized size = 0.82

$$-\frac{1}{2}i\left(x\text{PolyLog}\left(2,-ie^{-x}\right)-x\text{PolyLog}\left(2,ie^{-x}\right)+\text{PolyLog}\left(3,-ie^{-x}\right)-\text{PolyLog}\left(3,ie^{-x}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[E^x],x]
```

```
[Out] (-I/2)*(x*PolyLog[2, (-I)/E^x] - x*PolyLog[2, I/E^x] + PolyLog[3, (-I)/E^x]
 - PolyLog[3, I/E^x])
```

Maple [A] time = 0.185, size = 50, normalized size = 0.7

$$\frac{\pi x^2}{4}+\frac{i}{2}\text{polylog}\left(2,ie^x\right)x-\frac{i}{2}\text{polylog}\left(3,ie^x\right)-\frac{i}{2}x\text{polylog}\left(2,-ie^x\right)+\frac{i}{2}\text{polylog}\left(3,-ie^x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(exp(x)),x)
```

```
[Out] 1/4*Pi*x^2+1/2*I*polylog(2,I*exp(x))*x-1/2*I*polylog(3,I*exp(x))-1/2*I*poly
log(2,-I*exp(x))*x+1/2*I*polylog(3,-I*exp(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,x^2\arctan\left(e^{(-x)}\right)+\int\frac{x^2e^x}{2\left(e^{(2\,x)}+1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(exp(x)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arctan(e^(-x)) + integrate(1/2*x^2*e^x/(e^(2*x) + 1), x)
```

Fricas [C] time = 2.19322, size = 238, normalized size = 3.35

$$\frac{1}{2}\,x^2\,\mathrm{arccot}\left(e^x\right)-\frac{1}{4}i\,x^2\log\left(i\,e^x+1\right)+\frac{1}{4}i\,x^2\log\left(-i\,e^x+1\right)+\frac{1}{2}i\,x\mathrm{Li}_2\left(i\,e^x\right)-\frac{1}{2}i\,x\mathrm{Li}_2\left(-i\,e^x\right)-\frac{1}{2}i\,\mathrm{polylog}\left(3,i\,e^x\right)+\frac{1}{2}i\,\mathrm{p}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(exp(x)),x, algorithm="fricas")
```

```
[Out] 1/2*x^2*arccot(e^x) - 1/4*I*x^2*log(I*e^x + 1) + 1/4*I*x^2*log(-I*e^x + 1)
+ 1/2*I*x*dilog(I*e^x) - 1/2*I*x*dilog(-I*e^x) - 1/2*I*polylog(3, I*e^x) +
1/2*I*polylog(3, -I*e^x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x\,\mathrm{acot}\left(e^x\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(exp(x)),x)
```

```
[Out] Integral(x*acot(exp(x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}(e^{x}) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(exp(x)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(e^x), x)
```

3.220 $\int x^2 \cot^{-1}(e^x)\, dx$

Optimal. Leaf size=103

$$-\frac{1}{2}ix^2\text{PolyLog}(2,-ie^{-x})+\frac{1}{2}ix^2\text{PolyLog}(2,ie^{-x})-ix\text{PolyLog}(3,-ie^{-x})+ix\text{PolyLog}(3,ie^{-x})-i\text{PolyLog}(4,-ie^{-x})$$

```
[Out] (-I/2)*x^2*PolyLog[2, (-I)/E^x] + (I/2)*x^2*PolyLog[2, I/E^x] - I*x*PolyLog
[3, (-I)/E^x] + I*x*PolyLog[3, I/E^x] - I*PolyLog[4, (-I)/E^x] + I*PolyLog[
4, I/E^x]
```

Rubi [A] time = 0.0700694, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {5144, 2531, 6609, 2282, 6589}

$$-\frac{1}{2}ix^2\text{PolyLog}(2,-ie^{-x})+\frac{1}{2}ix^2\text{PolyLog}(2,ie^{-x})-ix\text{PolyLog}(3,-ie^{-x})+ix\text{PolyLog}(3,ie^{-x})-i\text{PolyLog}(4,-ie^{-x})$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[E^x],x]
```

```
[Out] (-I/2)*x^2*PolyLog[2, (-I)/E^x] + (I/2)*x^2*PolyLog[2, I/E^x] - I*x*PolyLog
[3, (-I)/E^x] + I*x*PolyLog[3, I/E^x] - I*PolyLog[4, (-I)/E^x] + I*PolyLog[
4, I/E^x]
```

Rule 5144

```
Int[ArcCot[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I/(a + b*f^(c + d*x))], x], x] - Dist[I/2, Int[
x^m*Log[1 + I/(a + b*f^(c + d*x))], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}\int x^2\cot^{-1}(e^x)\,dx &= \frac{1}{2}i\int x^2\log(1-ie^{-x})\,dx-\frac{1}{2}i\int x^2\log(1+ie^{-x})\,dx\\ &= -\frac{1}{2}ix^2\text{Li}_2(-ie^{-x})+\frac{1}{2}ix^2\text{Li}_2(ie^{-x})+i\int x\text{Li}_2(-ie^{-x})\,dx-i\int x\text{Li}_2(ie^{-x})\,dx\\ &= -\frac{1}{2}ix^2\text{Li}_2(-ie^{-x})+\frac{1}{2}ix^2\text{Li}_2(ie^{-x})-ix\text{Li}_3(-ie^{-x})+ix\text{Li}_3(ie^{-x})+i\int \text{Li}_3(-ie^{-x})\,dx-i\int \text{Li}_3(ie^{-x}\\ &= -\frac{1}{2}ix^2\text{Li}_2(-ie^{-x})+\frac{1}{2}ix^2\text{Li}_2(ie^{-x})-ix\text{Li}_3(-ie^{-x})+ix\text{Li}_3(ie^{-x})-i\,\text{Subst}\left(\int\frac{\text{Li}_3(-ix)}{x}\,dx,x,e^{-x}\right)+\\ &= -\frac{1}{2}ix^2\text{Li}_2(-ie^{-x})+\frac{1}{2}ix^2\text{Li}_2(ie^{-x})-ix\text{Li}_3(-ie^{-x})+ix\text{Li}_3(ie^{-x})-i\text{Li}_4(-ie^{-x})+i\text{Li}_4(ie^{-x})\end{aligned}$$

Mathematica [A] time = 0.0082515, size = 103, normalized size = 1.

$$-\frac{1}{2}ix^2\text{PolyLog}(2,-ie^{-x})+\frac{1}{2}ix^2\text{PolyLog}(2,ie^{-x})-ix\text{PolyLog}(3,-ie^{-x})+ix\text{PolyLog}(3,ie^{-x})-i\text{PolyLog}(4,-ie^{-x})+$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[E^x],x]
```

```
[Out] (-I/2)*x^2*PolyLog[2, (-I)/E^x] + (I/2)*x^2*PolyLog[2, I/E^x] - I*x*PolyLog
[3, (-I)/E^x] + I*x*PolyLog[3, I/E^x] - I*PolyLog[4, (-I)/E^x] + I*PolyLog[
4, I/E^x]
```

Maple [A] time = 0.154, size = 76, normalized size = 0.7

$$\frac{\pi x^3}{6} + \frac{i}{2}\text{polylog}(2, ie^x)\, x^2 - ix\text{polylog}(3, ie^x) + i\text{polylog}(4, ie^x) - \frac{i}{2}x^2\text{polylog}(2, -ie^x) + i\text{polylog}(3, -ie^x)\, x - i\text{pol}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(exp(x)),x)
```

```
[Out] 1/6*Pi*x^3+1/2*I*polylog(2,I*exp(x))*x^2-I*x*polylog(3,I*exp(x))+I*polylog(
4,I*exp(x))-1/2*I*polylog(2,-I*exp(x))*x^2+I*polylog(3,-I*exp(x))*x-I*polyl
og(4,-I*exp(x))
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\, x^3 \arctan\left(e^{(-x)}\right) + \int \frac{x^3 e^x}{3\left(e^{(2x)} + 1\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(exp(x)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arctan(e^(-x)) + integrate(1/3*x^3*e^x/(e^(2*x) + 1), x)
```

Fricas [C] time = 2.2362, size = 298, normalized size = 2.89

$$\frac{1}{3}\, x^3 \operatorname{arccot}(e^x) - \frac{1}{6} i\, x^3 \log(i\, e^x + 1) + \frac{1}{6} i\, x^3 \log(-i\, e^x + 1) + \frac{1}{2} i\, x^2 \text{Li}_2(i\, e^x) - \frac{1}{2} i\, x^2 \text{Li}_2(-i\, e^x) - i\, x\text{polylog}(3, i\, e^x) + i\, x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(exp(x)),x, algorithm="fricas")
```

```
[Out] 1/3*x^3*arccot(e^x) - 1/6*I*x^3*log(I*e^x + 1) + 1/6*I*x^3*log(-I*e^x + 1)
+ 1/2*I*x^2*dilog(I*e^x) - 1/2*I*x^2*dilog(-I*e^x) - I*x*polylog(3, I*e^x)
+ I*x*polylog(3, -I*e^x) + I*polylog(4, I*e^x) - I*polylog(4, -I*e^x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{acot}(e^x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(exp(x)),x)
```

```
[Out] Integral(x**2*acot(exp(x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}(e^x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(exp(x)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(e^x), x)
```

3.221 $\int \cot^{-1}\left(e^{a+bx}\right)\,dx$

Optimal. Leaf size=51

$$\frac{i\text{PolyLog}\left(2,ie^{-a-bx}\right)}{2b}-\frac{i\text{PolyLog}\left(2,-ie^{-a-bx}\right)}{2b}$$

```
[Out] ((-I/2)*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*PolyLog[2, I*E^(-a - b*x)
])/b
```

Rubi [A] time = 0.0302839, antiderivative size = 51, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 8, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {2282, 4849, 2391}

$$\frac{i\text{PolyLog}\left(2,ie^{-a-bx}\right)}{2b}-\frac{i\text{PolyLog}\left(2,-ie^{-a-bx}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[E^(a + b*x)],x]
```

```
[Out] ((-I/2)*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*PolyLog[2, I*E^(-a - b*x)
])/b
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 4849

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I/(c*x)]/x, x], x] - Dist[(I*b)/2, Int[Log[1
+ I/(c*x)]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \cot^{-1}\left(e^{a+bx}\right) dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{x} dx, x, e^{a+bx}\right)}{b}$$
$$= \frac{i\,\text{Subst}\left(\int \frac{\log\left(1-\frac{i}{x}\right)}{x} dx, x, e^{a+bx}\right)}{2b} - \frac{i\,\text{Subst}\left(\int \frac{\log\left(1+\frac{i}{x}\right)}{x} dx, x, e^{a+bx}\right)}{2b}$$
$$= -\frac{i\text{Li}_2\left(-ie^{-a-bx}\right)}{2b} + \frac{i\text{Li}_2\left(ie^{-a-bx}\right)}{2b}$$

Mathematica [A] time = 0.0790361, size = 83, normalized size = 1.63

$$x\cot^{-1}\left(e^{a+bx}\right) + \frac{i\left(-\text{PolyLog}\left(2,-ie^{a+bx}\right)+\text{PolyLog}\left(2,ie^{a+bx}\right)+bx\left(\log\left(1-ie^{a+bx}\right)-\log\left(1+ie^{a+bx}\right)\right)\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[E^(a + b*x)],x]
```

```
[Out] x*ArcCot[E^(a + b*x)] + ((I/2)*(b*x*(Log[1 - I*E^(a + b*x)] - Log[1 + I*E^(
a + b*x)]) - PolyLog[2, (-I)*E^(a + b*x)] + PolyLog[2, I*E^(a + b*x)]))/b
```

Maple [B] time = 0.058, size = 106, normalized size = 2.1

$$\frac{\ln\left(e^{bx+a}\right)\text{arccot}\left(e^{bx+a}\right)}{b} - \frac{\frac{i}{2}\ln\left(e^{bx+a}\right)\ln\left(1+ie^{bx+a}\right)}{b} + \frac{\frac{i}{2}\ln\left(e^{bx+a}\right)\ln\left(1-ie^{bx+a}\right)}{b} - \frac{\frac{i}{2}\text{dilog}\left(1+ie^{bx+a}\right)}{b} + \frac{\frac{i}{2}\text{dilog}\left(1-\right.}{b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(exp(b*x+a)),x)
```

```
[Out] 1/b*ln(exp(b*x+a))*arccot(exp(b*x+a))-1/2*I/b*ln(exp(b*x+a))*ln(1+I*exp(b*x
+a))+1/2*I/b*ln(exp(b*x+a))*ln(1-I*exp(b*x+a))-1/2*I/b*dilog(1+I*exp(b*x+a)
)+1/2*I/b*dilog(1-I*exp(b*x+a))
```

Maxima [A] time = 1.63464, size = 85, normalized size = 1.67

$$\frac{(bx+a)\operatorname{arccot}\left(e^{(bx+a)}\right)}{b}+\frac{\pi\log\left(e^{(2\,bx+2\,a)}+1\right)+2i\operatorname{Li}_2\left(i\,e^{(bx+a)}+1\right)-2i\operatorname{Li}_2\left(-i\,e^{(bx+a)}+1\right)}{4\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(b*x+a)),x, algorithm="maxima")
```

```
[Out] (b*x + a)*arccot(e^(b*x + a))/b + 1/4*(pi*log(e^(2*b*x + 2*a) + 1) + 2*I*di
log(I*e^(b*x + a) + 1) - 2*I*dilog(-I*e^(b*x + a) + 1))/b
```

Fricas [B] time = 2.38153, size = 297, normalized size = 5.82

$$\frac{2\,bx\operatorname{arccot}\left(e^{(bx+a)}\right)-i\,a\log\left(e^{(bx+a)}+i\right)+i\,a\log\left(e^{(bx+a)}-i\right)+(-i\,bx-i\,a)\log\left(i\,e^{(bx+a)}+1\right)+(i\,bx+i\,a)\log\left(-i\,e^{(bx+a}\right.}{2\,b}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*x*arccot(e^(b*x + a)) - I*a*log(e^(b*x + a) + I) + I*a*log(e^(b*x
+ a) - I) + (-I*b*x - I*a)*log(I*e^(b*x + a) + 1) + (I*b*x + I*a)*log(-I*e^
(b*x + a) + 1) + I*dilog(I*e^(b*x + a)) - I*dilog(-I*e^(b*x + a)))/b
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{acot}\left(e^{a+bx}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(exp(b*x+a)),x)
```

```
[Out] Integral(acot(exp(a + b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(e^{(bx+a)}\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(arccot(e^(b*x + a)), x)
```

3.222 $\int x \cot^{-1}\left(e^{a+bx}\right) dx$

Optimal. Leaf size=103

$$-\frac{i\text{PolyLog}\left(3,-ie^{-a-bx}\right)}{2b^2}+\frac{i\text{PolyLog}\left(3,ie^{-a-bx}\right)}{2b^2}-\frac{ix\text{PolyLog}\left(2,-ie^{-a-bx}\right)}{2b}+\frac{ix\text{PolyLog}\left(2,ie^{-a-bx}\right)}{2b}$$

```
[Out] ((-I/2)*x*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*x*PolyLog[2, I*E^(-a -
b*x)])/b - ((I/2)*PolyLog[3, (-I)*E^(-a - b*x)])/b^2 + ((I/2)*PolyLog[3, I*
E^(-a - b*x)])/b^2
```

Rubi [A] time = 0.0622578, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {5144, 2531, 2282, 6589}

$$-\frac{i\text{PolyLog}\left(3,-ie^{-a-bx}\right)}{2b^2}+\frac{i\text{PolyLog}\left(3,ie^{-a-bx}\right)}{2b^2}-\frac{ix\text{PolyLog}\left(2,-ie^{-a-bx}\right)}{2b}+\frac{ix\text{PolyLog}\left(2,ie^{-a-bx}\right)}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[E^(a + b*x)],x]
```

```
[Out] ((-I/2)*x*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*x*PolyLog[2, I*E^(-a -
b*x)])/b - ((I/2)*PolyLog[3, (-I)*E^(-a - b*x)])/b^2 + ((I/2)*PolyLog[3, I*
E^(-a - b*x)])/b^2
```

Rule 5144

```
Int[ArcCot[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I/(a + b*f^(c + d*x))], x], x] - Dist[I/2, Int[
x^m*Log[1 + I/(a + b*f^(c + d*x))], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}\left(e^{a+bx}\right)dx = \frac{1}{2}i\int x\log\left(1-ie^{-a-bx}\right)dx - \frac{1}{2}i\int x\log\left(1+ie^{-a-bx}\right)dx$$

$$= -\frac{ix\text{Li}_2\left(-ie^{-a-bx}\right)}{2b} + \frac{ix\text{Li}_2\left(ie^{-a-bx}\right)}{2b} + \frac{i\int\text{Li}_2\left(-ie^{-a-bx}\right)dx}{2b} - \frac{i\int\text{Li}_2\left(ie^{-a-bx}\right)dx}{2b}$$

$$= -\frac{ix\text{Li}_2\left(-ie^{-a-bx}\right)}{2b} + \frac{ix\text{Li}_2\left(ie^{-a-bx}\right)}{2b} - \frac{i\,\text{Subst}\left(\int\frac{\text{Li}_2(-ix)}{x}dx, x, e^{-a-bx}\right)}{2b^2} + \frac{i\,\text{Subst}\left(\int\frac{\text{Li}_2(ix)}{x}dx, x, e\right.}{2b^2}$$

$$= -\frac{ix\text{Li}_2\left(-ie^{-a-bx}\right)}{2b} + \frac{ix\text{Li}_2\left(ie^{-a-bx}\right)}{2b} - \frac{i\text{Li}_3\left(-ie^{-a-bx}\right)}{2b^2} + \frac{i\text{Li}_3\left(ie^{-a-bx}\right)}{2b^2}$$

Mathematica [A] time = 0.0138774, size = 83, normalized size = 0.81

$$-\frac{i\left(bx\text{PolyLog}\left(2,-ie^{-a-bx}\right)-bx\text{PolyLog}\left(2,ie^{-a-bx}\right)+\text{PolyLog}\left(3,-ie^{-a-bx}\right)-\text{PolyLog}\left(3,ie^{-a-bx}\right)\right)}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[E^(a + b*x)],x]
```

```
[Out] ((-I/2)*(b*x*PolyLog[2, (-I)*E^(-a - b*x)] - b*x*PolyLog[2, I*E^(-a - b*x)]
 + PolyLog[3, (-I)*E^(-a - b*x)] - PolyLog[3, I*E^(-a - b*x)]))/b^2
```

Maple [B] time = 0.25, size = 355, normalized size = 3.5

$$\frac{\pi x^2}{4} - \frac{\frac{i}{2}\mathrm{dilog}\left(-i\left(\mathrm{e}^{bx+a}+i\right)\right)a}{b^2} + \frac{\frac{i}{2}\ln\left(-i\left(-\mathrm{e}^{bx+a}+i\right)\right)xa}{b} - \frac{\frac{i}{2}\ln\left(-i\left(\mathrm{e}^{bx+a}+i\right)\right)a^2}{b^2} - \frac{\frac{i}{2}x\mathrm{polylog}\left(2,-i\mathrm{e}^{bx+a}\right)}{b} - \frac{\frac{i}{2}\mathrm{poly}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(exp(b*x+a)),x)
```

```
[Out] 1/4*Pi*x^2-1/2*I/b^2*dilog(-I*(exp(b*x+a)+I))*a+1/2*I/b*ln(-I*(-exp(b*x+a)+
I))*x*a-1/2*I/b^2*ln(-I*(exp(b*x+a)+I))*a^2-1/2*I/b*polylog(2,-I*exp(b*x+a)
)*x-1/2*I/b^2*polylog(2,-I*exp(b*x+a))*a-1/2*I/b^2*ln(-I*exp(b*x+a))*ln(-I*
(-exp(b*x+a)+I))*a+1/2*I/b^2*a^2*ln(1-I*exp(b*x+a))-1/2*I/b*ln(-I*(exp(b*x+
a)+I))*x*a-1/2*I/b*ln(1+I*exp(b*x+a))*x*a-1/2*I/b^2*a^2*ln(1+I*exp(b*x+a))+
1/2*I/b^2*ln(-I*(-exp(b*x+a)+I))*a^2-1/2*I/b^2*dilog(-I*exp(b*x+a))*a+1/2*I
/b*ln(1-I*exp(b*x+a))*x*a-1/2*I/b^2*polylog(3,I*exp(b*x+a))+1/2*I/b^2*polyl
og(3,-I*exp(b*x+a))+1/2*I/b*polylog(2,I*exp(b*x+a))*x+1/2*I/b^2*polylog(2,I
*exp(b*x+a))*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}x^2\arctan\left(e^{(-bx-a)}\right) + b\int\frac{x^2e^{(bx+a)}}{2\left(e^{(2\,bx+2\,a)}+1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(exp(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/2*x^2*arctan(e^(-b*x - a)) + b*integrate(1/2*x^2*e^(b*x + a)/(e^(2*b*x +
2*a) + 1), x)
```

Fricas [C] time = 2.45491, size = 431, normalized size = 4.18

$$\frac{2\,b^2x^2\,\mathrm{arccot}\left(e^{(bx+a)}\right) + 2i\,bx\mathrm{Li}_2\left(i\,e^{(bx+a)}\right) - 2i\,bx\mathrm{Li}_2\left(-i\,e^{(bx+a)}\right) + i\,a^2\log\left(e^{(bx+a)}+i\right) - i\,a^2\log\left(e^{(bx+a)}-i\right) + \left(-i\,b^2x^2\right.}{4\,b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(exp(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*b^2*x^2*arccot(e^(b*x + a)) + 2*I*b*x*dilog(I*e^(b*x + a)) - 2*I*b*x
*dilog(-I*e^(b*x + a)) + I*a^2*log(e^(b*x + a) + I) - I*a^2*log(e^(b*x + a)
 - I) + (-I*b^2*x^2 + I*a^2)*log(I*e^(b*x + a) + 1) + (I*b^2*x^2 - I*a^2)*l
og(-I*e^(b*x + a) + 1) - 2*I*polylog(3, I*e^(b*x + a)) + 2*I*polylog(3, -I*
e^(b*x + a)))/b^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{acot}\left(e^{a} e^{bx}\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(exp(b*x+a)),x)
```

```
[Out] Integral(x*acot(exp(a)*exp(b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x \operatorname{arccot}\left(e^{(bx+a)}\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(exp(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(e^(b*x + a)), x)
```

3.223 $\int x^2 \cot^{-1}\left(e^{a+bx}\right)\,dx$

Optimal. Leaf size=151

$$-\frac{ix\text{PolyLog}\left(3,-ie^{-a-bx}\right)}{b^2}+\frac{ix\text{PolyLog}\left(3,ie^{-a-bx}\right)}{b^2}-\frac{i\text{PolyLog}\left(4,-ie^{-a-bx}\right)}{b^3}+\frac{i\text{PolyLog}\left(4,ie^{-a-bx}\right)}{b^3}-\frac{ix^2\text{PolyLog}\left(\right.}{2b}$$

```
[Out] ((-I/2)*x^2*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*x^2*PolyLog[2, I*E^(-
a - b*x)])/b - (I*x*PolyLog[3, (-I)*E^(-a - b*x)])/b^2 + (I*x*PolyLog[3, I*
E^(-a - b*x)])/b^2 - (I*PolyLog[4, (-I)*E^(-a - b*x)])/b^3 + (I*PolyLog[4,
I*E^(-a - b*x)])/b^3
```

Rubi [A] time = 0.0977789, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {5144, 2531, 6609, 2282, 6589}

$$-\frac{ix\text{PolyLog}\left(3,-ie^{-a-bx}\right)}{b^2}+\frac{ix\text{PolyLog}\left(3,ie^{-a-bx}\right)}{b^2}-\frac{i\text{PolyLog}\left(4,-ie^{-a-bx}\right)}{b^3}+\frac{i\text{PolyLog}\left(4,ie^{-a-bx}\right)}{b^3}-\frac{ix^2\text{PolyLog}\left(\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[E^(a + b*x)],x]
```

```
[Out] ((-I/2)*x^2*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*x^2*PolyLog[2, I*E^(-
a - b*x)])/b - (I*x*PolyLog[3, (-I)*E^(-a - b*x)])/b^2 + (I*x*PolyLog[3, I*
E^(-a - b*x)])/b^2 - (I*PolyLog[4, (-I)*E^(-a - b*x)])/b^3 + (I*PolyLog[4,
I*E^(-a - b*x)])/b^3
```

Rule 5144

```
Int[ArcCot[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I/(a + b*f^(c + d*x))], x], x] - Dist[I/2, Int[
x^m*Log[1 + I/(a + b*f^(c + d*x))], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
```

```
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}\int x^2\cot^{-1}\left(e^{a+bx}\right)dx &= \frac{1}{2}i\int x^2\log\left(1-ie^{-a-bx}\right)dx-\frac{1}{2}i\int x^2\log\left(1+ie^{-a-bx}\right)dx\\ &= -\frac{ix^2\text{Li}_2\left(-ie^{-a-bx}\right)}{2b}+\frac{ix^2\text{Li}_2\left(ie^{-a-bx}\right)}{2b}+\frac{i\int x\text{Li}_2\left(-ie^{-a-bx}\right)dx}{b}-\frac{i\int x\text{Li}_2\left(ie^{-a-bx}\right)dx}{b}\\ &= -\frac{ix^2\text{Li}_2\left(-ie^{-a-bx}\right)}{2b}+\frac{ix^2\text{Li}_2\left(ie^{-a-bx}\right)}{2b}-\frac{ix\text{Li}_3\left(-ie^{-a-bx}\right)}{b^2}+\frac{ix\text{Li}_3\left(ie^{-a-bx}\right)}{b^2}+\frac{i\int\text{Li}_3\left(-ie^{-a-bx}\right)d}{b^2}\\ &= -\frac{ix^2\text{Li}_2\left(-ie^{-a-bx}\right)}{2b}+\frac{ix^2\text{Li}_2\left(ie^{-a-bx}\right)}{2b}-\frac{ix\text{Li}_3\left(-ie^{-a-bx}\right)}{b^2}+\frac{ix\text{Li}_3\left(ie^{-a-bx}\right)}{b^2}-\frac{i\,\text{Subst}\left(\int\frac{\text{Li}_3(-ix)}{x}d\right.}{b^3}\\ &= -\frac{ix^2\text{Li}_2\left(-ie^{-a-bx}\right)}{2b}+\frac{ix^2\text{Li}_2\left(ie^{-a-bx}\right)}{2b}-\frac{ix\text{Li}_3\left(-ie^{-a-bx}\right)}{b^2}+\frac{ix\text{Li}_3\left(ie^{-a-bx}\right)}{b^2}-\frac{i\text{Li}_4\left(-ie^{-a-bx}\right)}{b^3}+\end{aligned}$$

Mathematica [A] time = 0.008189, size = 151, normalized size = 1.

$$-\frac{ix\text{PolyLog}\left(3,-ie^{-a-bx}\right)}{b^2}+\frac{ix\text{PolyLog}\left(3,ie^{-a-bx}\right)}{b^2}-\frac{i\text{PolyLog}\left(4,-ie^{-a-bx}\right)}{b^3}+\frac{i\text{PolyLog}\left(4,ie^{-a-bx}\right)}{b^3}-\frac{ix^2\text{PolyLog}\left(2,\right.}{2b}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[E^(a + b*x)],x]
```

```
[Out] ((-I/2)*x^2*PolyLog[2, (-I)*E^(-a - b*x)])/b + ((I/2)*x^2*PolyLog[2, I*E^(-
a - b*x)])/b - (I*x*PolyLog[3, (-I)*E^(-a - b*x)])/b^2 + (I*x*PolyLog[3, I*
E^(-a - b*x)])/b^2 - (I*PolyLog[4, (-I)*E^(-a - b*x)])/b^3 + (I*PolyLog[4,
I*E^(-a - b*x)])/b^3
```

Maple [B] time = 0.253, size = 413, normalized size = 2.7

$$\frac{\pi x^3}{6} - \frac{\frac{i}{2}a^3 \ln\left(1 - ie^{bx+a}\right)}{b^3} + \frac{\frac{i}{2}\mathrm{polylog}\left(2, ie^{bx+a}\right)x^2}{b} - \frac{\frac{i}{2}x^2\mathrm{polylog}\left(2, -ie^{bx+a}\right)}{b} + \frac{\frac{i}{2}\ln\left(1 + ie^{bx+a}\right)xa^2}{b^2} + \frac{i\mathrm{polylog}\left(4, i\right.}{b^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(exp(b*x+a)),x)
```

```
[Out] 1/6*Pi*x^3-1/2*I/b^3*a^3*ln(1-I*exp(b*x+a))+1/2*I/b*polylog(2,I*exp(b*x+a))
*x^2-1/2*I/b*polylog(2,-I*exp(b*x+a))*x^2+1/2*I/b^2*ln(1+I*exp(b*x+a))*x*a^
2+I/b^3*polylog(4,I*exp(b*x+a))+1/2*I/b^3*polylog(2,-I*exp(b*x+a))*a^2-1/2*
I/b^3*polylog(2,I*exp(b*x+a))*a^2-1/2*I/b^2*ln(-I*(-exp(b*x+a)+I))*x*a^2-I/
b^3*polylog(4,-I*exp(b*x+a))-1/2*I/b^3*ln(-I*(-exp(b*x+a)+I))*a^3+1/2*I/b^3
*ln(-I*(exp(b*x+a)+I))*a^3+1/2*I/b^3*dilog(-I*(exp(b*x+a)+I))*a^2+1/2*I/b^3
*a^3*ln(1+I*exp(b*x+a))+1/2*I/b^3*ln(-I*exp(b*x+a))*ln(-I*(-exp(b*x+a)+I))*
a^2+1/2*I/b^3*dilog(-I*exp(b*x+a))*a^2+I/b^2*polylog(3,-I*exp(b*x+a))*x-I/b
^2*polylog(3,I*exp(b*x+a))*x+1/2*I/b^2*ln(-I*(exp(b*x+a)+I))*x*a^2-1/2*I/b^
2*ln(1-I*exp(b*x+a))*x*a^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}x^3 \arctan\left(e^{(-bx-a)}\right) + b\int \frac{x^3 e^{(bx+a)}}{3\left(e^{(2\,bx+2\,a)} + 1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(exp(b*x+a)),x, algorithm="maxima")
```

```
[Out] 1/3*x^3*arctan(e^(-b*x - a)) + b*integrate(1/3*x^3*e^(b*x + a)/(e^(2*b*x +
2*a) + 1), x)
```

Fricas [C] time = 2.6963, size = 540, normalized size = 3.58

$$\frac{2\,b^3x^3\,\mathrm{arccot}\left(e^{(bx+a)}\right) + 3i\,b^2x^2\mathrm{Li}_2\left(i\,e^{(bx+a)}\right) - 3i\,b^2x^2\mathrm{Li}_2\left(-i\,e^{(bx+a)}\right) - i\,a^3\log\left(e^{(bx+a)} + i\right) + i\,a^3\log\left(e^{(bx+a)} - i\right) - 6i\,bxp}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(exp(b*x+a)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^3*x^3*arccot(e^(b*x + a)) + 3*I*b^2*x^2*dilog(I*e^(b*x + a)) - 3*I
*b^2*x^2*dilog(-I*e^(b*x + a)) - I*a^3*log(e^(b*x + a) + I) + I*a^3*log(e^(
b*x + a) - I) - 6*I*b*x*polylog(3, I*e^(b*x + a)) + 6*I*b*x*polylog(3, -I*e
^(b*x + a)) + (-I*b^3*x^3 - I*a^3)*log(I*e^(b*x + a) + 1) + (I*b^3*x^3 + I*
a^3)*log(-I*e^(b*x + a) + 1) + 6*I*polylog(4, I*e^(b*x + a)) - 6*I*polylog(
4, -I*e^(b*x + a)))/b^3
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\,\mathrm{acot}\left(e^a e^{bx}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(exp(b*x+a)),x)
```

```
[Out] Integral(x**2*acot(exp(a)*exp(b*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2\,\mathrm{arccot}\left(e^{(bx+a)}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(exp(b*x+a)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(e^(b*x + a)), x)
```

3.224 $\int \cot^{-1}\left(a+bf^{c+dx}\right)\,dx$

Optimal. Leaf size=196

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)}{2d\log(f)}+\frac{i\text{PolyLog}\left(2,1-\frac{2bf^{c+dx}}{(-a+i)\left(1-i\left(a+bf^{c+dx}\right)\right)}\right)}{2d\log(f)}-\frac{\log\left(\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)\cot^{-1}\left(a+bf^{c+dx}\right)}{d\log(f)}+\frac{\log\left(\cdots\right.}{}$$

```
[Out] -((ArcCot[a + b*f^(c + d*x)]*Log[2/(1 - I*(a + b*f^(c + d*x)))])/(d*Log[f])
) + (ArcCot[a + b*f^(c + d*x)]*Log[(2*b*f^(c + d*x))/((I - a)*(1 - I*(a + b
*f^(c + d*x))))])/(d*Log[f]) - ((I/2)*PolyLog[2, 1 - 2/(1 - I*(a + b*f^(c +
 d*x)))])/(d*Log[f]) + ((I/2)*PolyLog[2, 1 - (2*b*f^(c + d*x))/((I - a)*(1
- I*(a + b*f^(c + d*x))))])/(d*Log[f])
```

Rubi [A] time = 0.154011, antiderivative size = 196, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2282, 5048, 4857, 2402, 2315, 2447}

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)}{2d\log(f)}+\frac{i\text{PolyLog}\left(2,1-\frac{2bf^{c+dx}}{(-a+i)\left(1-i\left(a+bf^{c+dx}\right)\right)}\right)}{2d\log(f)}-\frac{\log\left(\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)\cot^{-1}\left(a+bf^{c+dx}\right)}{d\log(f)}+\frac{\log\left(\cdots\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[a + b*f^(c + d*x)],x]
```

```
[Out] -((ArcCot[a + b*f^(c + d*x)]*Log[2/(1 - I*(a + b*f^(c + d*x)))])/(d*Log[f])
) + (ArcCot[a + b*f^(c + d*x)]*Log[(2*b*f^(c + d*x))/((I - a)*(1 - I*(a + b
*f^(c + d*x))))])/(d*Log[f]) - ((I/2)*PolyLog[2, 1 - 2/(1 - I*(a + b*f^(c +
 d*x)))])/(d*Log[f]) + ((I/2)*PolyLog[2, 1 - (2*b*f^(c + d*x))/((I - a)*(1
- I*(a + b*f^(c + d*x))))])/(d*Log[f])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 5048

```
Int[((a_.) + ArcCot[(c_) + (d_.)*(x_)]*(b_.))^(p_.)*((e_.) + (f_.)*(x_))^(m
_.), x_Symbol] :> Dist[1/d, Subst[Int[((d*e - c*f)/d + (f*x)/d)^m*(a + b*Ar
cCot[x])^p, x], x, c + d*x], x] /; FreeQ[{a, b, c, d, e, f, m, p}, x] && IG
tQ[p, 0]
```

Rule 4857

```
Int[((a_.) + ArcCot[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcCot[c*x])*Log[2/(1 - I*c*x)])/e, x] + (-Dist[(b*c)/e, Int[Lo
g[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] + Dist[(b*c)/e, Int[Log[(2*c*(d + e*
x))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcCot[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b
, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rubi steps

$$\int \cot^{-1}\left(a+bf^{c+dx}\right)\,dx = \frac{\text{Subst}\left(\int \frac{\cot^{-1}(a+bx)}{x}\,dx, x, f^{c+dx}\right)}{d\log(f)}$$

$$= \frac{\text{Subst}\left(\int \frac{\cot^{-1}(x)}{-\frac{a}{b}+\frac{x}{b}}\,dx, x, a+bf^{c+dx}\right)}{bd\log(f)}$$

$$= -\frac{\cot^{-1}\left(a+bf^{c+dx}\right)\log\left(\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)}{d\log(f)} + \frac{\cot^{-1}\left(a+bf^{c+dx}\right)\log\left(\frac{2bf^{c+dx}}{(i-a)\left(1-i\left(a+bf^{c+dx}\right)\right)}\right)}{d\log(f)} - \frac{\text{Subst}}{}$$

$$= -\frac{\cot^{-1}\left(a+bf^{c+dx}\right)\log\left(\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)}{d\log(f)} + \frac{\cot^{-1}\left(a+bf^{c+dx}\right)\log\left(\frac{2bf^{c+dx}}{(i-a)\left(1-i\left(a+bf^{c+dx}\right)\right)}\right)}{d\log(f)} + \frac{i\text{Li}_2\left(1\right.}{}$$

$$= -\frac{\cot^{-1}\left(a+bf^{c+dx}\right)\log\left(\frac{2}{1-i\left(a+bf^{c+dx}\right)}\right)}{d\log(f)} + \frac{\cot^{-1}\left(a+bf^{c+dx}\right)\log\left(\frac{2bf^{c+dx}}{(i-a)\left(1-i\left(a+bf^{c+dx}\right)\right)}\right)}{d\log(f)} - \frac{i\text{Li}_2\left(1\right.}{2}$$

Mathematica [A] time = 0.181573, size = 167, normalized size = 0.85

$$\frac{b\left(\text{PolyLog}\left(2,-\frac{b^2f^{c+dx}}{ab-\sqrt{-b^2}}\right)-\text{PolyLog}\left(2,-\frac{b^2f^{c+dx}}{ab+\sqrt{-b^2}}\right)+dx\log(f)\left(\log\left(\frac{b^2f^{c+dx}}{ab-\sqrt{-b^2}}+1\right)-\log\left(\frac{b^2f^{c+dx}}{ab+\sqrt{-b^2}}+1\right)\right)\right)}{2\sqrt{-b^2}d\log(f)}+x\cot^{-1}\left(a+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[a + b*f^(c + d*x)],x]
```

```
[Out] x*ArcCot[a + b*f^(c + d*x)] + (b*(d*x*Log[f]*(Log[1 + (b^2*f^(c + d*x))/(a*
b - Sqrt[-b^2])] - Log[1 + (b^2*f^(c + d*x))/(a*b + Sqrt[-b^2])]) + PolyLog
[2, -((b^2*f^(c + d*x))/(a*b - Sqrt[-b^2]))] - PolyLog[2, -((b^2*f^(c + d*x
))/(a*b + Sqrt[-b^2]))]))/(2*Sqrt[-b^2]*d*Log[f])
```

Maple [A] time = 0.057, size = 186, normalized size = 1.

$$\frac{\ln\left(bf^{dx+c}\right)\text{arccot}\left(a+bf^{dx+c}\right)}{d\ln\left(f\right)}-\frac{\frac{i}{2}\ln\left(bf^{dx+c}\right)}{d\ln\left(f\right)}\ln\left(\frac{-bf^{dx+c}-a+i}{i-a}\right)+\frac{\frac{i}{2}\ln\left(bf^{dx+c}\right)}{d\ln\left(f\right)}\ln\left(\frac{bf^{dx+c}+a+i}{i+a}\right)-\frac{\frac{i}{2}}{d\ln\left(f\right)}\text{dilog}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(a+b*f^(d*x+c)),x)
```

```
[Out] 1/d/ln(f)*ln(b*f^(d*x+c))*arccot(a+b*f^(d*x+c))-1/2*I/d/ln(f)*ln(b*f^(d*x+c
))*ln((-b*f^(d*x+c)-a+I)/(I-a))+1/2*I/d/ln(f)*ln(b*f^(d*x+c))*ln((b*f^(d*x+
c)+a+I)/(I+a))-1/2*I/d/ln(f)*dilog((-b*f^(d*x+c)-a+I)/(I-a))+1/2*I/d/ln(f)*
dilog((b*f^(d*x+c)+a+I)/(I+a))
```

Maxima [A] time = 1.71152, size = 302, normalized size = 1.54

$$\frac{\operatorname{arccot}\left(bf^{dx+c}+a\right)\log\left(f^{dx+c}\right)}{d\log\left(f\right)}+\frac{\arctan\left(\frac{bf^{dx+c}}{a^2+1},-\frac{abf^{dx+c}}{a^2+1}\right)\log\left(b^2f^{2\,dx+2\,c}+2\,abf^{dx+c}+a^2+1\right)-\arctan\left(bf^{dx+c}+a\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a+b*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] arccot(b*f^(d*x + c) + a)*log(f^(d*x + c))/(d*log(f)) + 1/2*(arctan2(b*f^(d
*x + c)/(a^2 + 1), -a*b*f^(d*x + c)/(a^2 + 1))*log(b^2*f^(2*d*x + 2*c) + 2*
a*b*f^(d*x + c) + a^2 + 1) - arctan(b*f^(d*x + c) + a)*log(b^2*f^(2*d*x + 2
*c)/(a^2 + 1)) + 2*arctan((b^2*f^(d*x + c) + a*b)/b)*log(f^(d*x + c)) + I*d
ilog((I*b*f^(d*x + c) + I*a + 1)/(I*a + 1)) - I*dilog((I*b*f^(d*x + c) + I*
a - 1)/(I*a - 1)))/(d*log(f))
```

Fricas [A] time = 2.69097, size = 554, normalized size = 2.83

$$\frac{2\,dx\operatorname{arccot}\left(bf^{dx+c}+a\right)\log\left(f\right)-i\,c\log\left(bf^{dx+c}+a+i\right)\log\left(f\right)+i\,c\log\left(bf^{dx+c}+a-i\right)\log\left(f\right)+\left(-i\,dx-i\,c\right)\log\left(f\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a+b*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*d*x*arccot(b*f^(d*x + c) + a)*log(f) - I*c*log(b*f^(d*x + c) + a + I
)*log(f) + I*c*log(b*f^(d*x + c) + a - I)*log(f) + (-I*d*x - I*c)*log(f)*lo
g((a^2 + (a*b + I*b)*f^(d*x + c) + 1)/(a^2 + 1)) + (I*d*x + I*c)*log(f)*log
```

```
((a^2 + (a*b - I*b)*f^(d*x + c) + 1)/(a^2 + 1)) - I*dilog(-(a^2 + (a*b + I*
b)*f^(d*x + c) + 1)/(a^2 + 1) + 1) + I*dilog(-(a^2 + (a*b - I*b)*f^(d*x + c
) + 1)/(a^2 + 1) + 1))/(d*log(f))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(a+b*f**(d*x+c)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \operatorname{arccot}\left(bf^{dx+c}+a\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(a+b*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(arccot(b*f^(d*x + c) + a), x)
```

3.225 $\int x\cot^{-1}\left(a+bf^{c+dx}\right)dx$

Optimal. Leaf size=250

$$\frac{i\text{PolyLog}\left(3,\frac{bf^{c+dx}}{-a+i}\right)}{2d^2\log^2(f)}-\frac{i\text{PolyLog}\left(3,-\frac{bf^{c+dx}}{a+i}\right)}{2d^2\log^2(f)}-\frac{ix\text{PolyLog}\left(2,\frac{bf^{c+dx}}{-a+i}\right)}{2d\log(f)}+\frac{ix\text{PolyLog}\left(2,-\frac{bf^{c+dx}}{a+i}\right)}{2d\log(f)}-\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+a}}{-a+}\right.$$

```
[Out] (-I/4)*x^2*Log[1 - (b*f^(c + d*x))/(I - a)] + (I/4)*x^2*Log[1 + (b*f^(c + d
*x))/(I + a)] + (I/4)*x^2*Log[1 - I/(a + b*f^(c + d*x))] - (I/4)*x^2*Log[1
+ I/(a + b*f^(c + d*x))] - ((I/2)*x*PolyLog[2, (b*f^(c + d*x))/(I - a)])/(d
*Log[f]) + ((I/2)*x*PolyLog[2, -((b*f^(c + d*x))/(I + a))])/(d*Log[f]) + ((
I/2)*PolyLog[3, (b*f^(c + d*x))/(I - a)])/(d^2*Log[f]^2) - ((I/2)*PolyLog[3
, -((b*f^(c + d*x))/(I + a))])/(d^2*Log[f]^2)
```

Rubi [A] time = 2.65375, antiderivative size = 250, normalized size of antiderivative = 1., number of steps used = 25, number of rules used = 8, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5144, 2551, 12, 6742, 2190, 2531, 2282, 6589}

$$\frac{i\text{PolyLog}\left(3,\frac{bf^{c+dx}}{-a+i}\right)}{2d^2\log^2(f)}-\frac{i\text{PolyLog}\left(3,-\frac{bf^{c+dx}}{a+i}\right)}{2d^2\log^2(f)}-\frac{ix\text{PolyLog}\left(2,\frac{bf^{c+dx}}{-a+i}\right)}{2d\log(f)}+\frac{ix\text{PolyLog}\left(2,-\frac{bf^{c+dx}}{a+i}\right)}{2d\log(f)}-\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+a}}{-a+}\right.$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcCot[a + b*f^(c + d*x)],x]
```

```
[Out] (-I/4)*x^2*Log[1 - (b*f^(c + d*x))/(I - a)] + (I/4)*x^2*Log[1 + (b*f^(c + d
*x))/(I + a)] + (I/4)*x^2*Log[1 - I/(a + b*f^(c + d*x))] - (I/4)*x^2*Log[1
+ I/(a + b*f^(c + d*x))] - ((I/2)*x*PolyLog[2, (b*f^(c + d*x))/(I - a)])/(d
*Log[f]) + ((I/2)*x*PolyLog[2, -((b*f^(c + d*x))/(I + a))])/(d*Log[f]) + ((
I/2)*PolyLog[3, (b*f^(c + d*x))/(I - a)])/(d^2*Log[f]^2) - ((I/2)*PolyLog[3
, -((b*f^(c + d*x))/(I + a))])/(d^2*Log[f]^2)
```

Rule 5144

```
Int[ArcCot[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I/(a + b*f^(c + d*x))], x], x] - Dist[I/2, Int[
x^m*Log[1 + I/(a + b*f^(c + d*x))], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 2551

```
Int[Log[u_]*((a_.) + (b_.)*(x_))^(m_.), x_Symbol] :> Simp[((a + b*x)^(m + 1
)*Log[u])/(b*(m + 1)), x] - Dist[1/(b*(m + 1)), Int[SimplifyIntegrand[((a +
 b*x)^(m + 1)*D[u, x])/u, x], x], x] /; FreeQ[{a, b, m}, x] && InverseFunct
ionFreeQ[u, x] && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\cot^{-1}\left(a+bf^{c+dx}\right)dx = \frac{1}{2}i\int x\log\left(1-\frac{i}{a+bf^{c+dx}}\right)dx-\frac{1}{2}i\int x\log\left(1+\frac{i}{a+bf^{c+dx}}\right)dx$$

$$= \frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1+\frac{i}{a+bf^{c+dx}}\right)+\frac{1}{4}\int\frac{bdf^{c+dx}x^2\log(f)}{\left(i(1-ia)+bf^{c+dx}\right)\left(a+bf\right.}$$

$$= \frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1+\frac{i}{a+bf^{c+dx}}\right)+\frac{1}{4}(bd\log(f))\int\frac{f^{c+d}}{\left(i(1-ia)+bf^{c+\cdots}\right.}$$

$$= \frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1+\frac{i}{a+bf^{c+dx}}\right)+\frac{1}{4}(bd\log(f))\int\left(\frac{if^{c+dx}x^2}{a+bf^{c+dx}}-\cdots\right.$$

$$= \frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1+\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}(ibd\log(f))\int\frac{f^{c+dx}x^2}{-i+a+bf^{c+dx}}$$

$$= -\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+dx}}{i-a}\right)+\frac{1}{4}ix^2\log\left(1+\frac{bf^{c+dx}}{i+a}\right)+\frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1\right.$$

$$= -\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+dx}}{i-a}\right)+\frac{1}{4}ix^2\log\left(1+\frac{bf^{c+dx}}{i+a}\right)+\frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1\right.$$

$$= -\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+dx}}{i-a}\right)+\frac{1}{4}ix^2\log\left(1+\frac{bf^{c+dx}}{i+a}\right)+\frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1\right.$$

$$= -\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+dx}}{i-a}\right)+\frac{1}{4}ix^2\log\left(1+\frac{bf^{c+dx}}{i+a}\right)+\frac{1}{4}ix^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)-\frac{1}{4}ix^2\log\left(1\right.$$

Mathematica [A] time = 0.284365, size = 250, normalized size = 1.

$$\frac{i\text{PolyLog}\left(3,\frac{bf^{c+dx}}{-a+i}\right)}{2d^2\log^2(f)}-\frac{i\text{PolyLog}\left(3,-\frac{bf^{c+dx}}{a+i}\right)}{2d^2\log^2(f)}-\frac{ix\text{PolyLog}\left(2,\frac{bf^{c+dx}}{-a+i}\right)}{2d\log(f)}+\frac{ix\text{PolyLog}\left(2,-\frac{bf^{c+dx}}{a+i}\right)}{2d\log(f)}-\frac{1}{4}ix^2\log\left(1-\frac{bf^{c+a}}{-a+\cdots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcCot[a + b*f^(c + d*x)],x]
```

```
[Out] (-I/4)*x^2*Log[1 - (b*f^(c + d*x))/(I - a)] + (I/4)*x^2*Log[1 + (b*f^(c + d
*x))/(I + a)] + (I/4)*x^2*Log[1 - I/(a + b*f^(c + d*x))] - (I/4)*x^2*Log[1
+ I/(a + b*f^(c + d*x))] - ((I/2)*x*PolyLog[2, (b*f^(c + d*x))/(I - a)])/(d
*Log[f]) + ((I/2)*x*PolyLog[2, -((b*f^(c + d*x))/(I + a))])/(d*Log[f]) + ((
I/2)*PolyLog[3, (b*f^(c + d*x))/(I - a)])/(d^2*Log[f]^2) - ((I/2)*PolyLog[3
```

```
, -((b*f^(c + d*x))/(I + a))])/(d^2*Log[f]^2)
```

Maple [B] time = 0.414, size = 678, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arccot(a+b*f^(d*x+c)),x)
```

```
[Out] -1/2*I/d*c*ln((b*f^(d*x)*f^c+I+a)/(I+a))*x+1/4*Pi*x^2+1/4*I/d^2*ln(1-I*b/(1
-I*a)*f^(d*x)*f^c)*c^2+1/2*I/d^2*c^2*ln((b*f^(d*x)*f^c+a-I)/(-I+a))-1/2*I/d
^2*c^2*ln((b*f^(d*x)*f^c+I+a)/(I+a))-1/2*I/d^2/ln(f)*c*dilog((b*f^(d*x)*f^c
+I+a)/(I+a))-1/4*I*x^2*ln(1-I*(a+b*f^(d*x+c)))-1/2*I/d*ln(1-I*b/(-I*a-1)*f^
(d*x)*f^c)*x*c-1/4*I/d^2*c^2*ln(I*f^(d*x)*f^c*b+I*a+1)+1/2*I/d^2/ln(f)*poly
log(2,I*b/(1-I*a)*f^(d*x)*f^c)*c+1/2*I/d^2/ln(f)^2*polylog(3,I*b/(-I*a-1)*f
^(d*x)*f^c)+1/2*I/d^2/ln(f)*c*dilog((b*f^(d*x)*f^c+a-I)/(-I+a))-1/2*I/d/ln(
f)*polylog(2,I*b/(-I*a-1)*f^(d*x)*f^c)*x-1/2*I/d^2/ln(f)^2*polylog(3,I*b/(1
-I*a)*f^(d*x)*f^c)+1/2*I/d*ln(1-I*b/(1-I*a)*f^(d*x)*f^c)*x*c+1/4*I/d^2*c^2*
ln(1-I*a-I*f^(d*x)*f^c*b)-1/4*I/d^2*ln(1-I*b/(-I*a-1)*f^(d*x)*f^c)*c^2+1/2*
I/d/ln(f)*polylog(2,I*b/(1-I*a)*f^(d*x)*f^c)*x-1/2*I/d^2/ln(f)*polylog(2,I*
b/(-I*a-1)*f^(d*x)*f^c)*c+1/2*I/d*c*ln((b*f^(d*x)*f^c+a-I)/(-I+a))*x+1/4*I*
x^2*ln(1+I*(a+b*f^(d*x+c)))-1/4*I*ln(1-I*b/(-I*a-1)*f^(d*x)*f^c)*x^2+1/4*I*
ln(1-I*b/(1-I*a)*f^(d*x)*f^c)*x^2
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a+b*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [C] time = 2.81829, size = 778, normalized size = 3.11

$$\frac{2\,d^2x^2\,\mathrm{arccot}\left(bf^{dx+c}+a\right)\log\left(f\right)^2+i\,c^2\log\left(bf^{dx+c}+a+i\right)\log\left(f\right)^2-i\,c^2\log\left(bf^{dx+c}+a-i\right)\log\left(f\right)^2-2i\,dx\mathrm{Li}_2\left(-\frac{a^2}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a+b*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*d^2*x^2*arccot(b*f^(d*x + c) + a)*log(f)^2 + I*c^2*log(b*f^(d*x + c)
 + a + I)*log(f)^2 - I*c^2*log(b*f^(d*x + c) + a - I)*log(f)^2 - 2*I*d*x*di
log(-(a^2 + (a*b + I*b)*f^(d*x + c) + 1)/(a^2 + 1) + 1)*log(f) + 2*I*d*x*di
log(-(a^2 + (a*b - I*b)*f^(d*x + c) + 1)/(a^2 + 1) + 1)*log(f) + (-I*d^2*x^
2 + I*c^2)*log(f)^2*log((a^2 + (a*b + I*b)*f^(d*x + c) + 1)/(a^2 + 1)) + (I
*d^2*x^2 - I*c^2)*log(f)^2*log((a^2 + (a*b - I*b)*f^(d*x + c) + 1)/(a^2 + 1
)) + 2*I*polylog(3, -(a*b + I*b)*f^(d*x + c)/(a^2 + 1)) - 2*I*polylog(3, -(
a*b - I*b)*f^(d*x + c)/(a^2 + 1)))/(d^2*log(f)^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*acot(a+b*f**(d*x+c)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x\,\mathrm{arccot}\left(bf^{dx+c}+a\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arccot(a+b*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x*arccot(b*f^(d*x + c) + a), x)
```

3.226 $\int x^2 \cot^{-1}\left(a+bf^{c+dx}\right)\,dx$

Optimal. Leaf size=313

$$\frac{ix\text{PolyLog}\left(3,\frac{bf^{c+dx}}{-a+i}\right)}{d^2\log^2(f)}-\frac{ix\text{PolyLog}\left(3,-\frac{bf^{c+dx}}{a+i}\right)}{d^2\log^2(f)}-\frac{i\text{PolyLog}\left(4,\frac{bf^{c+dx}}{-a+i}\right)}{d^3\log^3(f)}+\frac{i\text{PolyLog}\left(4,-\frac{bf^{c+dx}}{a+i}\right)}{d^3\log^3(f)}-\frac{ix^2\text{PolyLog}\left(2,\frac{bf^{c+d}}{-a+i}\right.}{2d\log(f)}$$

```
[Out] (-I/6)*x^3*Log[1 - (b*f^(c + d*x))/(I - a)] + (I/6)*x^3*Log[1 + (b*f^(c + d
*x))/(I + a)] + (I/6)*x^3*Log[1 - I/(a + b*f^(c + d*x))] - (I/6)*x^3*Log[1
+ I/(a + b*f^(c + d*x))] - ((I/2)*x^2*PolyLog[2, (b*f^(c + d*x))/(I - a)])/
(d*Log[f]) + ((I/2)*x^2*PolyLog[2, -((b*f^(c + d*x))/(I + a))])/(d*Log[f])
+ (I*x*PolyLog[3, (b*f^(c + d*x))/(I - a)])/(d^2*Log[f]^2) - (I*x*PolyLog[3
, -((b*f^(c + d*x))/(I + a))])/(d^2*Log[f]^2) - (I*PolyLog[4, (b*f^(c + d*x
))/(I - a)])/(d^3*Log[f]^3) + (I*PolyLog[4, -((b*f^(c + d*x))/(I + a))])/(d
^3*Log[f]^3)
```

Rubi [A] time = 2.44833, antiderivative size = 313, normalized size of antiderivative = 1., number of steps used = 29, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {5144, 2551, 12, 6742, 2190, 2531, 6609, 2282, 6589}

$$\frac{ix\text{PolyLog}\left(3,\frac{bf^{c+dx}}{-a+i}\right)}{d^2\log^2(f)}-\frac{ix\text{PolyLog}\left(3,-\frac{bf^{c+dx}}{a+i}\right)}{d^2\log^2(f)}-\frac{i\text{PolyLog}\left(4,\frac{bf^{c+dx}}{-a+i}\right)}{d^3\log^3(f)}+\frac{i\text{PolyLog}\left(4,-\frac{bf^{c+dx}}{a+i}\right)}{d^3\log^3(f)}-\frac{ix^2\text{PolyLog}\left(2,\frac{bf^{c+d}}{-a+i}\right.}{2d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcCot[a + b*f^(c + d*x)],x]
```

```
[Out] (-I/6)*x^3*Log[1 - (b*f^(c + d*x))/(I - a)] + (I/6)*x^3*Log[1 + (b*f^(c + d
*x))/(I + a)] + (I/6)*x^3*Log[1 - I/(a + b*f^(c + d*x))] - (I/6)*x^3*Log[1
+ I/(a + b*f^(c + d*x))] - ((I/2)*x^2*PolyLog[2, (b*f^(c + d*x))/(I - a)])/
(d*Log[f]) + ((I/2)*x^2*PolyLog[2, -((b*f^(c + d*x))/(I + a))])/(d*Log[f])
+ (I*x*PolyLog[3, (b*f^(c + d*x))/(I - a)])/(d^2*Log[f]^2) - (I*x*PolyLog[3
, -((b*f^(c + d*x))/(I + a))])/(d^2*Log[f]^2) - (I*PolyLog[4, (b*f^(c + d*x
))/(I - a)])/(d^3*Log[f]^3) + (I*PolyLog[4, -((b*f^(c + d*x))/(I + a))])/(d
^3*Log[f]^3)
```

Rule 5144

```
Int[ArcCot[(a_.) + (b_.)*(f_)^((c_.) + (d_.)*(x_))]*(x_)^(m_.), x_Symbol] :
> Dist[I/2, Int[x^m*Log[1 - I/(a + b*f^(c + d*x))], x], x] - Dist[I/2, Int[
```

```
x^m*Log[1 + I/(a + b*f^(c + d*x))], x], x] /; FreeQ[{a, b, c, d, f}, x] &&
IntegerQ[m] && m > 0
```

Rule 2551

```
Int[Log[u_]*((a_.) + (b_.)*(x_))^(m_.), x_Symbol] :> Simp[((a + b*x)^(m + 1
)*Log[u])/(b*(m + 1)), x] - Dist[1/(b*(m + 1)), Int[SimplifyIntegrand[((a +
 b*x)^(m + 1)*D[u, x])/u, x], x], x] /; FreeQ[{a, b, m}, x] && InverseFunct
ionFreeQ[u, x] && NeQ[m, -1]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 6742

```
Int[u_, x_Symbol] :> With[{v = ExpandIntegrand[u, x]}, Int[v, x] /; SumQ[v]
]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2 \cot^{-1}\left(a+bf^{c+dx}\right) dx = \frac{1}{2}i\int x^2\log\left(1-\frac{i}{a+bf^{c+dx}}\right)dx - \frac{1}{2}i\int x^2\log\left(1+\frac{i}{a+bf^{c+dx}}\right)dx$$
$$= \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(1+\frac{i}{a+bf^{c+dx}}\right) + \frac{1}{6}\int \frac{bdf^{c+dx}x^3\log(f)}{\left(i(1-ia)+bf^{c+dx}\right)\left(a+b\right.}$$
$$= \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(1+\frac{i}{a+bf^{c+dx}}\right) + \frac{1}{6}(bd\log(f))\int \frac{f^{c+}}{\left(i(1-ia)+bf^{c}\right.}$$
$$= \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(1+\frac{i}{a+bf^{c+dx}}\right) + \frac{1}{6}(bd\log(f))\int\left(\frac{if^{c+dx}x^3}{a+bf^{c+dx}} - \right.$$
$$= \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(1+\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}(ibd\log(f))\int \frac{f^{c+dx}x^3}{-i+a+bf^{c+dx}}$$
$$= -\frac{1}{6}ix^3\log\left(1-\frac{bf^{c+dx}}{i-a}\right) + \frac{1}{6}ix^3\log\left(1+\frac{bf^{c+dx}}{i+a}\right) + \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(\right.$$
$$= -\frac{1}{6}ix^3\log\left(1-\frac{bf^{c+dx}}{i-a}\right) + \frac{1}{6}ix^3\log\left(1+\frac{bf^{c+dx}}{i+a}\right) + \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(\right.$$
$$= -\frac{1}{6}ix^3\log\left(1-\frac{bf^{c+dx}}{i-a}\right) + \frac{1}{6}ix^3\log\left(1+\frac{bf^{c+dx}}{i+a}\right) + \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(\right.$$
$$= -\frac{1}{6}ix^3\log\left(1-\frac{bf^{c+dx}}{i-a}\right) + \frac{1}{6}ix^3\log\left(1+\frac{bf^{c+dx}}{i+a}\right) + \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(\right.$$
$$= -\frac{1}{6}ix^3\log\left(1-\frac{bf^{c+dx}}{i-a}\right) + \frac{1}{6}ix^3\log\left(1+\frac{bf^{c+dx}}{i+a}\right) + \frac{1}{6}ix^3\log\left(1-\frac{i}{a+bf^{c+dx}}\right) - \frac{1}{6}ix^3\log\left(\right.$$

Mathematica [A] time = 0.229287, size = 313, normalized size = 1.

$$\frac{ix\text{PolyLog}\left(3,\frac{bf^{c+dx}}{-a+i}\right)}{d^2\log^2(f)} - \frac{ix\text{PolyLog}\left(3,-\frac{bf^{c+dx}}{a+i}\right)}{d^2\log^2(f)} - \frac{i\text{PolyLog}\left(4,\frac{bf^{c+dx}}{-a+i}\right)}{d^3\log^3(f)} + \frac{i\text{PolyLog}\left(4,-\frac{bf^{c+dx}}{a+i}\right)}{d^3\log^3(f)} - \frac{ix^2\text{PolyLog}\left(2,\frac{bf^{c}}{-a}\right.}{2d\log(f)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcCot[a + b*f^(c + d*x)],x]
```

```
[Out] (-I/6)*x^3*Log[1 - (b*f^(c + d*x))/(I - a)] + (I/6)*x^3*Log[1 + (b*f^(c + d
*x))/(I + a)] + (I/6)*x^3*Log[1 - I/(a + b*f^(c + d*x))] - (I/6)*x^3*Log[1
+ I/(a + b*f^(c + d*x))] - ((I/2)*x^2*PolyLog[2, (b*f^(c + d*x))/(I - a)])/
```

```
(d*Log[f]) + ((I/2)*x^2*PolyLog[2, -((b*f^(c + d*x))/(I + a))])/(d*Log[f])
+ (I*x*PolyLog[3, (b*f^(c + d*x))/(I - a)])/(d^2*Log[f]^2) - (I*x*PolyLog[3
, -((b*f^(c + d*x))/(I + a))])/(d^2*Log[f]^2) - (I*PolyLog[4, (b*f^(c + d*x
))/(I - a)])/(d^3*Log[f]^3) + (I*PolyLog[4, -((b*f^(c + d*x))/(I + a))])/(d
^3*Log[f]^3)
```

Maple [B] time = 0.408, size = 764, normalized size = 2.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arccot(a+b*f^(d*x+c)),x)
```

```
[Out] 1/6*Pi*x^3+1/2*I/d^2*c^2*ln((b*f^(d*x)*f^c+I+a)/(I+a))*x-1/2*I/d^2*ln(1-I*b
/(1-I*a)*f^(d*x)*f^c)*x*c^2+1/2*I/d^3/ln(f)*c^2*dilog((b*f^(d*x)*f^c+I+a)/(
I+a))-1/2*I/d^2*c^2*ln((b*f^(d*x)*f^c+a-I)/(-I+a))*x+1/2*I/d^2*ln(1-I*b/(-I
*a-1)*f^(d*x)*f^c)*x*c^2+1/2*I/d^3/ln(f)*polylog(2,I*b/(-I*a-1)*f^(d*x)*f^c
)*c^2-1/2*I/d^3/ln(f)*c^2*dilog((b*f^(d*x)*f^c+a-I)/(-I+a))-1/2*I/d/ln(f)*p
olylog(2,I*b/(-I*a-1)*f^(d*x)*f^c)*x^2-I/d^2/ln(f)^2*polylog(3,I*b/(1-I*a)*
f^(d*x)*f^c)*x+1/2*I/d/ln(f)*polylog(2,I*b/(1-I*a)*f^(d*x)*f^c)*x^2-1/2*I/d
^3/ln(f)*polylog(2,I*b/(1-I*a)*f^(d*x)*f^c)*c^2+I/d^2/ln(f)^2*polylog(3,I*b
/(-I*a-1)*f^(d*x)*f^c)*x-1/6*I*x^3*ln(1-I*(a+b*f^(d*x+c)))+1/6*I*ln(1-I*b/(
1-I*a)*f^(d*x)*f^c)*x^3-1/6*I*ln(1-I*b/(-I*a-1)*f^(d*x)*f^c)*x^3+1/6*I*x^3*
ln(1+I*(a+b*f^(d*x+c)))+I/d^3/ln(f)^3*polylog(4,I*b/(1-I*a)*f^(d*x)*f^c)+1/
6*I/d^3*c^3*ln(I*f^(d*x)*f^c*b+I*a+1)-1/2*I/d^3*c^3*ln((b*f^(d*x)*f^c+a-I)/
(-I+a))+1/2*I/d^3*c^3*ln((b*f^(d*x)*f^c+I+a)/(I+a))+1/3*I/d^3*ln(1-I*b/(-I*
a-1)*f^(d*x)*f^c)*c^3-I/d^3/ln(f)^3*polylog(4,I*b/(-I*a-1)*f^(d*x)*f^c)-1/3
*I/d^3*ln(1-I*b/(1-I*a)*f^(d*x)*f^c)*c^3-1/6*I/d^3*c^3*ln(1-I*a-I*f^(d*x)*f
^c*b)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a+b*f^(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [C] time = 2.80613, size = 967, normalized size = 3.09

$$\frac{2\,d^3x^3\operatorname{arccot}\left(bf^{dx+c}+a\right)\log\left(f\right)^3-3i\,d^2x^2\operatorname{Li}_2\left(-\frac{a^2+(ab+i\,b)f^{dx+c}+1}{a^2+1}+1\right)\log\left(f\right)^2+3i\,d^2x^2\operatorname{Li}_2\left(-\frac{a^2+(ab-i\,b)f^{dx+c}+1}{a^2+1}+1\right)\log\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a+b*f^(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*d^3*x^3*arccot(b*f^(d*x + c) + a)*log(f)^3 - 3*I*d^2*x^2*dilog(-(a^2
 + (a*b + I*b)*f^(d*x + c) + 1)/(a^2 + 1) + 1)*log(f)^2 + 3*I*d^2*x^2*dilog
(-(a^2 + (a*b - I*b)*f^(d*x + c) + 1)/(a^2 + 1) + 1)*log(f)^2 - I*c^3*log(b
*f^(d*x + c) + a + I)*log(f)^3 + I*c^3*log(b*f^(d*x + c) + a - I)*log(f)^3
+ (-I*d^3*x^3 - I*c^3)*log(f)^3*log((a^2 + (a*b + I*b)*f^(d*x + c) + 1)/(a^
2 + 1)) + (I*d^3*x^3 + I*c^3)*log(f)^3*log((a^2 + (a*b - I*b)*f^(d*x + c) +
 1)/(a^2 + 1)) + 6*I*d*x*log(f)*polylog(3, -(a*b + I*b)*f^(d*x + c)/(a^2 +
1)) - 6*I*d*x*log(f)*polylog(3, -(a*b - I*b)*f^(d*x + c)/(a^2 + 1)) - 6*I*p
olylog(4, -(a*b + I*b)*f^(d*x + c)/(a^2 + 1)) + 6*I*polylog(4, -(a*b - I*b)
*f^(d*x + c)/(a^2 + 1)))/(d^3*log(f)^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*acot(a+b*f**(d*x+c)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \operatorname{arccot}\left(bf^{dx+c}+a\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arccot(a+b*f^(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(x^2*arccot(b*f^(d*x + c) + a), x)
```

3.227 $\int e^{-x} \cot^{-1}(e^x)\,dx$

Optimal. Leaf size=27

$$-x+\frac{1}{2}\log\left(e^{2x}+1\right)-e^{-x}\cot^{-1}\left(e^x\right)$$

```
[Out] -x - ArcCot[E^x]/E^x + Log[1 + E^(2*x)]/2
```

Rubi [A] time = 0.0203293, antiderivative size = 27, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.6, Rules used = {2194, 5208, 2282, 36, 29, 31}

$$-x+\frac{1}{2}\log\left(e^{2x}+1\right)-e^{-x}\cot^{-1}\left(e^x\right)$$

Antiderivative was successfully verified.

```
[In] Int[ArcCot[E^x]/E^x,x]
```

```
[Out] -x - ArcCot[E^x]/E^x + Log[1 + E^(2*x)]/2
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] && !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}\int e^{-x}\cot^{-1}(e^x)\,dx &= -e^{-x}\cot^{-1}(e^x)-\int\frac{1}{1+e^{2x}}\,dx\\ &= -e^{-x}\cot^{-1}(e^x)-\frac{1}{2}\,\text{Subst}\left(\int\frac{1}{x(1+x)}\,dx,x,e^{2x}\right)\\ &= -e^{-x}\cot^{-1}(e^x)-\frac{1}{2}\,\text{Subst}\left(\int\frac{1}{x}\,dx,x,e^{2x}\right)+\frac{1}{2}\,\text{Subst}\left(\int\frac{1}{1+x}\,dx,x,e^{2x}\right)\\ &= -x-e^{-x}\cot^{-1}(e^x)+\frac{1}{2}\log\left(1+e^{2x}\right)\end{aligned}$$

Mathematica [A] time = 0.0208115, size = 27, normalized size = 1.

$$-x+\frac{1}{2}\log\left(e^{2x}+1\right)-e^{-x}\cot^{-1}(e^x)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcCot[E^x]/E^x,x]
```

```
[Out] -x - ArcCot[E^x]/E^x + Log[1 + E^(2*x)]/2
```

Maple [A] time = 0.027, size = 25, normalized size = 0.9

$$-\frac{\operatorname{arccot}(e^x)}{e^x}+\frac{\ln\left((e^x)^2+1\right)}{2}-\ln(e^x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arccot(exp(x))/exp(x),x)
```

```
[Out] -arccot(exp(x))/exp(x)+1/2*ln(exp(x)^2+1)-ln(exp(x))
```

Maxima [A] time = 0.986912, size = 26, normalized size = 0.96

$$-\operatorname{arccot}\left(e^{x}\right)e^{(-x)}+\frac{1}{2}\log\left(e^{(-2x)}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(x))/exp(x),x, algorithm="maxima")
```

```
[Out] -arccot(e^x)*e^(-x) + 1/2*log(e^(-2*x) + 1)
```

Fricas [A] time = 2.40037, size = 84, normalized size = 3.11

$$-\frac{1}{2}\left(2\,xe^{x}-e^{x}\log\left(e^{(2x)}+1\right)+2\,\operatorname{arccot}\left(e^{x}\right)\right)e^{(-x)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(x))/exp(x),x, algorithm="fricas")
```

```
[Out] -1/2*(2*x*e^x - e^x*log(e^(2*x) + 1) + 2*arccot(e^x))*e^(-x)
```

Sympy [A] time = 12.8936, size = 19, normalized size = 0.7

$$-x+\frac{\log\left(e^{2x}+1\right)}{2}-e^{-x}\operatorname{acot}\left(e^{x}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(acot(exp(x))/exp(x),x)
```

```
[Out] -x + log(exp(2*x) + 1)/2 - exp(-x)*acot(exp(x))
```

<u>Giac</u> [A] time = 1.09532, size = 28, normalized size = 1.04

$$-\arctan\left(e^{(-x)}\right)e^{(-x)} + \frac{1}{2}\log\left(e^{(-2x)} + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arccot(exp(x))/exp(x),x, algorithm="giac")
```

```
[Out] -arctan(e^(-x))*e^(-x) + 1/2*log(e^(-2*x) + 1)
```

3.228 $\int \frac{1}{(a+ax^2)(b-2b\cot^{-1}(x))}\,dx$

Optimal. Leaf size=17

$$\frac{\log\left(1-2\cot^{-1}(x)\right)}{2ab}$$

```
[Out] Log[1 - 2*ArcCot[x]]/(2*a*b)
```

Rubi [A] time = 0.04, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4883}

$$\frac{\log\left(1-2\cot^{-1}(x)\right)}{2ab}$$

Antiderivative was successfully verified.

```
[In] Int[1/((a + a*x^2)*(b - 2*b*ArcCot[x])),x]
```

```
[Out] Log[1 - 2*ArcCot[x]]/(2*a*b)
```

Rule 4883

```
Int[1/(((a_.) + ArcCot[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)), x_Symbol]
 :> -Simp[Log[RemoveContent[a + b*ArcCot[c*x], x]]/(b*c*d), x] /; FreeQ[{a,
 b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{1}{\left(a+ax^2\right)\left(b-2b\cot^{-1}(x)\right)}\,dx=\frac{\log\left(1-2\cot^{-1}(x)\right)}{2ab}$$

Mathematica [A] time = 0.0447506, size = 17, normalized size = 1.

$$\frac{\log\left(2\cot^{-1}(x)-1\right)}{2ab}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((a + a*x^2)*(b - 2*b*ArcCot[x])),x]
```

```
[Out] Log[-1 + 2*ArcCot[x]]/(2*a*b)
```

Maple [A] time = 0.128, size = 19, normalized size = 1.1

$$\frac{\ln(2\,b\mathrm{arccot}(x) - b)}{2\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a*x^2+a)/(b-2*b*arccot(x)),x)
```

```
[Out] 1/2/a*ln(2*b*arccot(x)-b)/b
```

Maxima [A] time = 1.01412, size = 23, normalized size = 1.35

$$\frac{\log(|2\,\arctan(1, x) - 1|)}{2\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*x^2+a)/(b-2*b*arccot(x)),x, algorithm="maxima")
```

```
[Out] 1/2*log(abs(2*arctan2(1, x) - 1))/(a*b)
```

Fricas [A] time = 2.34995, size = 43, normalized size = 2.53

$$\frac{\log(2\,\mathrm{arccot}(x) - 1)}{2\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*x^2+a)/(b-2*b*arccot(x)),x, algorithm="fricas")
```

```
[Out] 1/2*log(2*arccot(x) - 1)/(a*b)
```

Sympy [A] time = 0.74049, size = 12, normalized size = 0.71

$$\frac{\log\left(\operatorname{acot}(x)-\frac{1}{2}\right)}{2ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*x**2+a)/(b-2*b*acot(x)),x)
```

```
[Out] log(acot(x) - 1/2)/(2*a*b)
```

Giac [A] time = 1.14587, size = 24, normalized size = 1.41

$$\frac{\log\left(\left|2\,\arctan\left(\frac{1}{x}\right)-1\right|\right)}{2\,ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a*x^2+a)/(b-2*b*arccot(x)),x, algorithm="giac")
```

```
[Out] 1/2*log(abs(2*arctan(1/x) - 1))/(a*b)
```

3.229 $\int e^{c(a+bx)} \cot^{-1}(\sinh(ac+bcx))\,dx$

Optimal. Leaf size=47

$$\frac{\log\left(e^{2c(a+bx)}+1\right)}{bc}+\frac{e^{ac+bcx}\cot^{-1}(\sinh(c(a+bx)))}{bc}$$

```
[Out] (E^(a*c + b*c*x)*ArcCot[Sinh[c*(a + b*x)]])/(b*c) + Log[1 + E^(2*c*(a + b*x
))]/(b*c)
```

Rubi [A] time = 0.0744283, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {2194, 5208, 2282, 12, 260}

$$\frac{\log\left(e^{2c(a+bx)}+1\right)}{bc}+\frac{e^{ac+bcx}\cot^{-1}(\sinh(c(a+bx)))}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c*(a + b*x))*ArcCot[Sinh[a*c + b*c*x]],x]
```

```
[Out] (E^(a*c + b*c*x)*ArcCot[Sinh[c*(a + b*x)]])/(b*c) + Log[1 + E^(2*c*(a + b*x
))]/(b*c)
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}
\int e^{c(a+bx)}\cot^{-1}(\sinh(ac+bcx))\,dx &= \frac{\text{Subst}\left(\int e^x\cot^{-1}(\sinh(x))\,dx,x,ac+bcx\right)}{bc}\\
&= \frac{e^{ac+bcx}\cot^{-1}(\sinh(c(a+bx)))}{bc}+\frac{\text{Subst}\left(\int e^x\,\mathbf{sech}(x)\,dx,x,ac+bcx\right)}{bc}\\
&= \frac{e^{ac+bcx}\cot^{-1}(\sinh(c(a+bx)))}{bc}+\frac{\text{Subst}\left(\int\frac{2x}{1+x^2}\,dx,x,e^{ac+bcx}\right)}{bc}\\
&= \frac{e^{ac+bcx}\cot^{-1}(\sinh(c(a+bx)))}{bc}+\frac{2\,\text{Subst}\left(\int\frac{x}{1+x^2}\,dx,x,e^{ac+bcx}\right)}{bc}\\
&= \frac{e^{ac+bcx}\cot^{-1}(\sinh(c(a+bx)))}{bc}+\frac{\log\left(1+e^{2c(a+bx)}\right)}{bc}
\end{aligned}$$

Mathematica [A] time = 0.10424, size = 61, normalized size = 1.3

$$\frac{\log\left(e^{2c(a+bx)}+1\right)-e^{c(a+bx)}\cot^{-1}\left(\frac{1}{2}e^{-c(a+bx)}-\frac{1}{2}e^{c(a+bx)}\right)}{bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[E^(c*(a + b*x))*ArcCot[Sinh[a*c + b*c*x]],x]
```

```
[Out] (-(E^(c*(a + b*x))*ArcCot[1/(2*E^(c*(a + b*x))) - E^(c*(a + b*x))/2]) + Log
[1 + E^(2*c*(a + b*x))])/(b*c)
```

Maple [C] time = 0.337, size = 1281, normalized size = 27.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*(b*x+a))*arccot(sinh(b*c*x+a*c)),x)
```

```
[Out] -2*a/b-1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a))*(exp(c*(b*x+a))+I)^2)*csgn(exp(-c*
(b*x+a))*(exp(c*(b*x+a))+I)^2)*exp(c*(b*x+a))+ln(1+exp(2*c*(b*x+a)))/b/c+1/
4/c/b*Pi*csgn(I*(exp(c*(b*x+a))-I)^2)*csgn(I*exp(-c*(b*x+a)))*csgn(I*exp(-c
*(b*x+a))*(exp(c*(b*x+a))-I)^2)*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(c*(b*
x+a))+I)^2)*csgn(I*exp(-c*(b*x+a)))*csgn(I*exp(-c*(b*x+a))*(exp(c*(b*x+a))+
I)^2)*exp(c*(b*x+a))-I/c/b*exp(c*(b*x+a))*ln(exp(c*(b*x+a))+I)+1/4/c/b*Pi*c
sgn(I*(exp(c*(b*x+a))-I))^2*csgn(I*(exp(c*(b*x+a))-I)^2)*exp(c*(b*x+a))-1/2
/c/b*Pi*csgn(I*(exp(c*(b*x+a))-I))*csgn(I*(exp(c*(b*x+a))-I)^2)^2*exp(c*(b*
x+a))-1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a))*(exp(c*(b*x+a))-I)^2)*csgn(exp(-c*(
b*x+a))*(exp(c*(b*x+a))-I)^2)^2*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(c*(b*
x+a))-I)^2)*csgn(I*exp(-c*(b*x+a))*(exp(c*(b*x+a))-I)^2)^2*exp(c*(b*x+a))-1
/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I))^2*csgn(I*(exp(c*(b*x+a))+I)^2)*exp(c*(
b*x+a))+1/2/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I))*csgn(I*(exp(c*(b*x+a))+I)^2)^
2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a))*(exp(c*(b*x+a))+I)^2)*cs
gn(exp(-c*(b*x+a))*(exp(c*(b*x+a))+I)^2)^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I
*(exp(c*(b*x+a))+I)^2)*csgn(I*exp(-c*(b*x+a))*(exp(c*(b*x+a))+I)^2)^2*exp(c
*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a)))*csgn(I*exp(-c*(b*x+a))*(exp(c*
(b*x+a))+I)^2)^2*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a)))*csgn(I*e
xp(-c*(b*x+a))*(exp(c*(b*x+a))-I)^2)^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*exp
(-c*(b*x+a))*(exp(c*(b*x+a))-I)^2)*csgn(exp(-c*(b*x+a))*(exp(c*(b*x+a))-I)^
2)*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(exp(-c*(b*x+a))*(exp(c*(b*x+a))-I)^2)^3*e
xp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))-I)^2)^3*exp(c*(b*x+a))-1/4/
c/b*Pi*csgn(exp(-c*(b*x+a))*(exp(c*(b*x+a))+I)^2)^3*exp(c*(b*x+a))-1/4/c/b*
Pi*csgn(I*(exp(c*(b*x+a))+I)^2)^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*exp(-c*(
b*x+a))*(exp(c*(b*x+a))+I)^2)^3*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*
x+a))*(exp(c*(b*x+a))-I)^2)^3*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(exp(-c*(b*x+a)
)*(exp(c*(b*x+a))-I)^2)^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(exp(-c*(b*x+a))*(e
xp(c*(b*x+a))+I)^2)^2*exp(c*(b*x+a))+I/c/b*exp(c*(b*x+a))*ln(exp(c*(b*x+a))
-I)
```

Maxima [A] time = 1.52502, size = 63, normalized size = 1.34

$$\frac{\operatorname{arccot}\left(\sinh\left(bcx + ac\right)\right)e^{\left(\left(bx+a\right)c\right)}}{bc} + \frac{\log\left(e^{\left(2\,bcx+2\,ac\right)} + 1\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(sinh(b*c*x+a*c)),x, algorithm="maxima")
```

```
[Out] arccot(sinh(b*c*x + a*c))*e^((b*x + a)*c)/(b*c) + log(e^(2*b*c*x + 2*a*c) +
 1)/(b*c)
```

Fricas [B] time = 2.49421, size = 343, normalized size = 7.3

$$\frac{(\cosh(bcx+ac)+\sinh(bcx+ac))\arctan\left(\frac{2(\cosh(bcx+ac)+\sinh(bcx+ac))}{\cosh(bcx+ac)^2+2\cosh(bcx+ac)\sinh(bcx+ac)+\sinh(bcx+ac)^2-1}\right)+\log\left(\frac{2\cosh(bcx+ac)}{\cosh(bcx+ac)-\sinh(bcx+ac)}\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(sinh(b*c*x+a*c)),x, algorithm="fricas")
```

```
[Out] ((cosh(b*c*x + a*c) + sinh(b*c*x + a*c))*arctan(2*(cosh(b*c*x + a*c) + sinh
(b*c*x + a*c))/(cosh(b*c*x + a*c)^2 + 2*cosh(b*c*x + a*c)*sinh(b*c*x + a*c)
 + sinh(b*c*x + a*c)^2 - 1)) + log(2*cosh(b*c*x + a*c)/(cosh(b*c*x + a*c) -
 sinh(b*c*x + a*c))))/(b*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*acot(sinh(b*c*x+a*c)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.14281, size = 89, normalized size = 1.89

$$\frac{\left(\arctan\left(\frac{2}{e^{(bcx+ac)}-e^{(-bcx-ac)}}\right)e^{(bcx)}+e^{(-ac)}\log\left(e^{(2\,bcx+2\,ac)}+1\right)\right)e^{(ac)}}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(sinh(b*c*x+a*c)),x, algorithm="giac")
```

```
[Out] (arctan(2/(e^(b*c*x + a*c) - e^(-b*c*x - a*c)))*e^(b*c*x) + e^(-a*c)*log(e^
(2*b*c*x + 2*a*c) + 1))*e^(a*c)/(b*c)
```

3.230 $\int e^{c(a+bx)}\cot^{-1}(\cosh(ac+bcx))\,dx$

Optimal. Leaf size=103

$$\frac{\left(1-\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3-2\sqrt{2}\right)}{2bc}+\frac{\left(1+\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3+2\sqrt{2}\right)}{2bc}+\frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}$$

```
[Out] (E^(a*c + b*c*x)*ArcCot[Cosh[c*(a + b*x)]])/(b*c) + ((1 - Sqrt[2])*Log[3 -
2*Sqrt[2] + E^(2*c*(a + b*x))])/(2*b*c) + ((1 + Sqrt[2])*Log[3 + 2*Sqrt[2]
+ E^(2*c*(a + b*x))])/(2*b*c)
```

Rubi [A] time = 0.139005, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {2194, 5208, 2282, 12, 1247, 632, 31}

$$\frac{\left(1-\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3-2\sqrt{2}\right)}{2bc}+\frac{\left(1+\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3+2\sqrt{2}\right)}{2bc}+\frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c*(a + b*x))*ArcCot[Cosh[a*c + b*c*x]],x]
```

```
[Out] (E^(a*c + b*c*x)*ArcCot[Cosh[c*(a + b*x)]])/(b*c) + ((1 - Sqrt[2])*Log[3 -
2*Sqrt[2] + E^(2*c*(a + b*x))])/(2*b*c) + ((1 + Sqrt[2])*Log[3 + 2*Sqrt[2]
+ E^(2*c*(a + b*x))])/(2*b*c)
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 632

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int e^{c(a+bx)}\cot^{-1}(\cosh(ac+bcx))\,dx = \frac{\text{Subst}\left(\int e^x\cot^{-1}(\cosh(x))\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}+\frac{\text{Subst}\left(\int \frac{e^x\sinh(x)}{1+\cosh^2(x)}\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}+\frac{\text{Subst}\left(\int \frac{2x(-1+x^2)}{1+6x^2+x^4}\,dx,x,e^{ac+bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}+\frac{2\,\text{Subst}\left(\int \frac{x(-1+x^2)}{1+6x^2+x^4}\,dx,x,e^{ac+bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}+\frac{\text{Subst}\left(\int \frac{-1+x}{1+6x+x^2}\,dx,x,e^{2ac+2bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}+\frac{\left(1-\sqrt{2}\right)\text{Subst}\left(\int \frac{1}{3-2\sqrt{2}+x}\,dx,x,e^{2ac+2bcx}\right)}{2bc}+\frac{(1}{}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\cosh(c(a+bx)))}{bc}+\frac{\left(1-\sqrt{2}\right)\log\left(3-2\sqrt{2}+e^{2ac+2bcx}\right)}{2bc}+\frac{\left(1+\sqrt{2}\right)\mathrm{l}}{}$$

Mathematica [C] time = 0.139229, size = 146, normalized size = 1.42

$$\frac{\text{RootSum}\left[\#1^4+6\#1^2+1\&,\frac{7\#1^2\log\left(e^{c(a+bx)}-\#1\right)-7\#1^2ac-7\#1^2bcx+\log\left(e^{c(a+bx)}-\#1\right)-ac-bcx}{3\#1^2+1}\&\right]+4c(a+bx)+2e^{c(a+bx)}\cot^{-1}\left(\frac{1}{2}e^{-c}\right.}{2bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[E^(c*(a + b*x))*ArcCot[Cosh[a*c + b*c*x]],x]
```

```
[Out] (4*c*(a + b*x) + 2*E^(c*(a + b*x))*ArcCot[(1 + E^(2*c*(a + b*x)))/(2*E^(c*(
a + b*x)))] + RootSum[1 + 6*#1^2 + #1^4 & , (-(a*c) - b*c*x + Log[E^(c*(a +
 b*x)) - #1] - 7*a*c*#1^2 - 7*b*c*x*#1^2 + 7*Log[E^(c*(a + b*x)) - #1]*#1^2
)/(1 + 3*#1^2) & ])/(2*b*c)
```

Maple [C] time = 0.394, size = 1358, normalized size = 13.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*(b*x+a))*arccot(cosh(b*c*x+a*c)),x)
```

```
[Out] -1/2*I/c/b*exp(c*(b*x+a))*ln(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a)))-1/4/c/b
*Pi*csgn(I*exp(-c*(b*x+a))*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))^3*exp(
c*(b*x+a))-1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a)))*csgn(I*exp(-c*(b*x+a))*(-exp(
2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(-ex
p(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))*csgn(I*exp(-c*(b*x+a))*(-exp(2*c*(b*x
+a))-1+2*I*exp(c*(b*x+a))))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*x+
a))*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))*csgn(exp(-c*(b*x+a))*(-exp(2*
c*(b*x+a))-1+2*I*exp(c*(b*x+a))))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c
*(b*x+a)))*csgn(I*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))*csgn(I*exp(-c*(
b*x+a))*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))*exp(c*(b*x+a))-1/4/c/b*Pi
*csgn(exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))^3*exp(c*(b*x
+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a
))))*csgn(exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))^2*exp(c*
(b*x+a))+1/4/c/b*Pi*csgn(exp(-c*(b*x+a))*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*
x+a))))^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a)))*csgn(I*(exp(2*c
*(b*x+a))+1+2*I*exp(c*(b*x+a))))*csgn(I*exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1
+2*I*exp(c*(b*x+a))))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a)))*csg
n(I*exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))^2*exp(c*(b*x+a
))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))*csgn(I*exp(-c
*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))^2*exp(c*(b*x+a))-1/4/c/b
*Pi*csgn(I*exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))^3*exp(c
*(b*x+a))+1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a))*(-exp(2*c*(b*x+a))-1+2*I*exp(c*
(b*x+a))))*csgn(exp(-c*(b*x+a))*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))*e
xp(c*(b*x+a))+1/4/c/b*Pi*csgn(exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*exp(c
*(b*x+a))))^2*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*exp(-c*(b*x+a))*(exp(2*c*(b*
x+a))+1+2*I*exp(c*(b*x+a))))*csgn(exp(-c*(b*x+a))*(exp(2*c*(b*x+a))+1+2*I*e
xp(c*(b*x+a))))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(exp(-c*(b*x+a))*(-exp(2*c*(b
*x+a))-1+2*I*exp(c*(b*x+a))))^2*exp(c*(b*x+a))+1/2*I/c/b*exp(c*(b*x+a))*ln(
exp(2*c*(b*x+a))+1-2*I*exp(c*(b*x+a)))+1/2/c/b*ln(exp(2*c*(b*x+a))+(1+2^(1/
2))^2)*2^(1/2)-1/2/c/b*ln(exp(2*c*(b*x+a))+(2^(1/2)-1)^2)*2^(1/2)-2*a/b+1/2
/c/b*ln(exp(2*c*(b*x+a))+(1+2^(1/2))^2)+1/2/c/b*ln(exp(2*c*(b*x+a))+(2^(1/2
)-1)^2)
```

Maxima [A] time = 1.54056, size = 177, normalized size = 1.72

$$\frac{\operatorname{arccot}\left(\cosh\left(bcx+ac\right)\right)e^{\left((bx+a)c\right)}}{bc}+\frac{\sqrt{2}\log\left(-\frac{2\sqrt{2}-e^{\left(-2\,bcx-2\,ac\right)}-3}{2\sqrt{2}+e^{\left(-2\,bcx-2\,ac\right)}+3}\right)}{2\,bc}+\frac{2\left(bcx+ac\right)}{bc}+\frac{\log\left(6\,e^{\left(-2\,bcx-2\,ac\right)}+e^{\left(-4\,bcx-4\,ac\right)}+1\right)}{2\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(cosh(b*c*x+a*c)),x, algorithm="maxima")
```

```
[Out] arccot(cosh(b*c*x + a*c))*e^((b*x + a)*c)/(b*c) + 1/2*sqrt(2)*log(-(2*sqrt(
2) - e^(-2*b*c*x - 2*a*c) - 3)/(2*sqrt(2) + e^(-2*b*c*x - 2*a*c) + 3))/(b*c
) + 2*(b*c*x + a*c)/(b*c) + 1/2*log(6*e^(-2*b*c*x - 2*a*c) + e^(-4*b*c*x -
4*a*c) + 1)/(b*c)
```

Fricas [B] time = 2.71541, size = 741, normalized size = 7.19

$$2\left(\cosh\left(bcx+ac\right)+\sinh\left(bcx+ac\right)\right)\arctan\left(\frac{2\left(\cosh(bcx+ac)+\sinh(bcx+ac)\right)}{\cosh(bcx+ac)^{2}+2\,\cosh(bcx+ac)\sinh(bcx+ac)+\sinh(bcx+ac)^{2}+1}\right)+\sqrt{2}\log\left(\frac{3\left(2\,\sqrt{2}+3\right)\cos}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(cosh(b*c*x+a*c)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(cosh(b*c*x + a*c) + sinh(b*c*x + a*c))*arctan(2*(cosh(b*c*x + a*c)
+ sinh(b*c*x + a*c))/(cosh(b*c*x + a*c)^2 + 2*cosh(b*c*x + a*c)*sinh(b*c*x
+ a*c) + sinh(b*c*x + a*c)^2 + 1)) + sqrt(2)*log((3*(2*sqrt(2) + 3)*cosh(b*
c*x + a*c)^2 - 4*(3*sqrt(2) + 4)*cosh(b*c*x + a*c)*sinh(b*c*x + a*c) + 3*(2
*sqrt(2) + 3)*sinh(b*c*x + a*c)^2 + 2*sqrt(2) + 3)/(cosh(b*c*x + a*c)^2 + s
inh(b*c*x + a*c)^2 + 3)) + log(2*(cosh(b*c*x + a*c)^2 + sinh(b*c*x + a*c)^2
 + 3)/(cosh(b*c*x + a*c)^2 - 2*cosh(b*c*x + a*c)*sinh(b*c*x + a*c) + sinh(b
*c*x + a*c)^2)))/(b*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*acot(cosh(b*c*x+a*c)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.13431, size = 208, normalized size = 2.02

$$-\frac{\left(\sqrt{2}e^{(-ac)}\log\left(-\frac{2\sqrt{2}e^{(2ac)}-e^{(2bcx+4ac)}-3e^{(2ac)}}{2\sqrt{2}e^{(2ac)}+e^{(2bcx+4ac)}+3e^{(2ac)}}\right)-2\arctan\left(\frac{2}{e^{(bcx+ac)}+e^{(-bcx-ac)}}\right)e^{(bcx)}-e^{(-ac)}\log\left(e^{(4bcx+4ac)}+6e^{(2bcx+2ac)}+1\right)\right)e}{2bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(cosh(b*c*x+a*c)),x, algorithm="giac")
```

```
[Out] -1/2*(sqrt(2)*e^(-a*c)*log(-(2*sqrt(2)*e^(2*a*c) - e^(2*b*c*x + 4*a*c) - 3*
e^(2*a*c))/(2*sqrt(2)*e^(2*a*c) + e^(2*b*c*x + 4*a*c) + 3*e^(2*a*c))) - 2*a
rctan(2/(e^(b*c*x + a*c) + e^(-b*c*x - a*c)))*e^(b*c*x) - e^(-a*c)*log(e^(4
*b*c*x + 4*a*c) + 6*e^(2*b*c*x + 2*a*c) + 1))*e^(a*c)/(b*c)
```

3.231 $\int e^{c(a+bx)} \cot^{-1}(\tanh(ac+bcx))\,dx$

Optimal. Leaf size=180

$$\frac{\log\left(e^{2c(a+bx)}-\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}-\frac{\log\left(e^{2c(a+bx)}+\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}-\frac{\tan^{-1}\left(1-\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc}+\frac{\tan^{-1}\left(\sqrt{2}e^{ac+bcx}+1\right)}{\sqrt{2}bc}+e^{ac+}$$

```
[Out] (E^(a*c + b*c*x)*ArcCot[Tanh[c*(a + b*x)]])/(b*c) - ArcTan[1 - Sqrt[2]*E^(a
*c + b*c*x)]/(Sqrt[2]*b*c) + ArcTan[1 + Sqrt[2]*E^(a*c + b*c*x)]/(Sqrt[2]*b
*c) + Log[1 + E^(2*c*(a + b*x)) - Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
- Log[1 + E^(2*c*(a + b*x)) + Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
```

Rubi [A] time = 0.177584, antiderivative size = 180, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2194, 5208, 12, 2249, 297, 1162, 617, 204, 1165, 628}

$$\frac{\log\left(e^{2c(a+bx)}-\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}-\frac{\log\left(e^{2c(a+bx)}+\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}-\frac{\tan^{-1}\left(1-\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc}+\frac{\tan^{-1}\left(\sqrt{2}e^{ac+bcx}+1\right)}{\sqrt{2}bc}+e^{ac+}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c*(a + b*x))*ArcCot[Tanh[a*c + b*c*x]],x]
```

```
[Out] (E^(a*c + b*c*x)*ArcCot[Tanh[c*(a + b*x)]])/(b*c) - ArcTan[1 - Sqrt[2]*E^(a
*c + b*c*x)]/(Sqrt[2]*b*c) + ArcTan[1 + Sqrt[2]*E^(a*c + b*c*x)]/(Sqrt[2]*b
*c) + Log[1 + E^(2*c*(a + b*x)) - Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
- Log[1 + E^(2*c*(a + b*x)) + Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
```

```
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rubi steps

$$\int e^{c(a+bx)}\cot^{-1}(\tanh(ac+bcx))\,dx = \frac{\text{Subst}\left(\int e^x\cot^{-1}(\tanh(x))\,dx, x, ac+bcx\right)}{bc}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} + \frac{\text{Subst}\left(\int \frac{2e^{3x}}{1+e^{4x}}\,dx, x, ac+bcx\right)}{bc}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} + \frac{2\,\text{Subst}\left(\int \frac{e^{3x}}{1+e^{4x}}\,dx, x, ac+bcx\right)}{bc}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} + \frac{2\,\text{Subst}\left(\int \frac{x^2}{1+x^4}\,dx, x, e^{ac+bcx}\right)}{bc}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} - \frac{\text{Subst}\left(\int \frac{1-x^2}{1+x^4}\,dx, x, e^{ac+bcx}\right)}{bc} + \frac{\text{Subst}\left(\int \frac{1+x^2}{1+x^4}\,d\right.}{bc}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} + \frac{\text{Subst}\left(\int \frac{1}{1-\sqrt{2}x+x^2}\,dx, x, e^{ac+bcx}\right)}{2bc} + \frac{\text{Subst}\left(\int \right.}{}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} + \frac{\log\left(1-\sqrt{2}e^{ac+bcx}+e^{2ac+2bcx}\right)}{2\sqrt{2}bc} - \frac{\log\left(1+\sqrt{2}e^{a\right.}}{2}$$

$$= \frac{e^{ac+bcx}\cot^{-1}(\tanh(c(a+bx)))}{bc} - \frac{\tan^{-1}\left(1-\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc} + \frac{\tan^{-1}\left(1+\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc}$$

Mathematica [C] time = 0.109173, size = 89, normalized size = 0.49

$$\frac{\text{RootSum}\left[\#1^4+1\&, \frac{\log\left(e^{c(a+bx)}-\#1\right)-ac-bcx}{\#1}\&\right]+2e^{c(a+bx)}\cot^{-1}\left(\frac{e^{2c(a+bx)}-1}{e^{2c(a+bx)}+1}\right)}{2bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[E^(c*(a + b*x))*ArcCot[Tanh[a*c + b*c*x]],x]
```

```
[Out] (2*E^(c*(a + b*x))*ArcCot[(-1 + E^(2*c*(a + b*x)))/(1 + E^(2*c*(a + b*x)))]
 + RootSum[1 + #1^4 & , (-(a*c) - b*c*x + Log[E^(c*(a + b*x)) - #1])/#1 & ]
)/(2*b*c)
```

Maple [C] time = 0.403, size = 1323, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*(b*x+a))*arccot(tanh(b*c*x+a*c)),x)
```

```
[Out] -1/4*I/c/b*ln(exp(c*(b*x+a))+(1/2-1/2*I)*2^(1/2))*2^(1/2)+1/2*I/c/b*exp(c*(
b*x+a))*ln(exp(2*c*(b*x+a))-I)+1/4*I/c/b*ln(exp(c*(b*x+a))+(-1/2+1/2*I)*2^(
1/2))*2^(1/2)-1/4*I/c/b*ln(exp(c*(b*x+a))-(1/2+1/2*I)*2^(1/2))*2^(1/2)+1/4*
I/c/b*ln(exp(c*(b*x+a))+(1/2+1/2*I)*2^(1/2))*2^(1/2)+1/4/c/b*exp(c*(b*x+a))
*Pi-1/2*I/c/b*exp(c*(b*x+a))*ln(exp(2*c*(b*x+a))+I)-1/4/c/b*Pi*csgn(I*(exp(
2*c*(b*x+a))-I))*csgn(I*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))^2*exp(c*
(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))*csgn(
(1+I)*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))^2*exp(c*(b*x+a))-1/4/c/b*P
i*csgn(I*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))*csgn((1-I)*(exp(2*c*(b*
x+a))-I)/(1+exp(2*c*(b*x+a))))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*
(b*x+a))+I))*csgn(I*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))^2*exp(c*(b*x
+a))-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))*csgn((1+I
)*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn
(I*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))*csgn((1-I)*(exp(2*c*(b*x+a))-
I)/(1+exp(2*c*(b*x+a))))*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I/(1+exp(2*c*(b*x+a
))))*csgn(I*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))^2*exp(c*(b*x+a))+1/4
/c/b*Pi*csgn(I/(1+exp(2*c*(b*x+a))))*csgn(I*(exp(2*c*(b*x+a))+I)/(1+exp(2*c
*(b*x+a))))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I/(1+exp(2*c*(b*x+a))))*csgn(I
*(exp(2*c*(b*x+a))-I))*csgn(I*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))*ex
p(c*(b*x+a))-1/4/c/b*Pi*csgn(I/(1+exp(2*c*(b*x+a))))*csgn(I*(exp(2*c*(b*x+a
))+I))*csgn(I*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))*exp(c*(b*x+a))-1/4
/c/b*ln(exp(c*(b*x+a))+(1/2-1/2*I)*2^(1/2))*2^(1/2)+1/4/c/b*ln(exp(c*(b*x+a
))+(-1/2+1/2*I)*2^(1/2))*2^(1/2)+1/4/c/b*ln(exp(c*(b*x+a))-(1/2+1/2*I)*2^(1
/2))*2^(1/2)-1/4/c/b*ln(exp(c*(b*x+a))+(1/2+1/2*I)*2^(1/2))*2^(1/2)-1/4/c/b
*Pi*csgn((1+I)*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))^3*exp(c*(b*x+a))+
1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))^3*exp(c*(b*x+a
))-1/4/c/b*Pi*csgn((1-I)*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(b*x+a))))^3*exp(c
*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))))^3*ex
```

```
p(c*(b*x+a))+1/4/c/b*Pi*csgn((1+I)*(exp(2*c*(b*x+a))+I)/(1+exp(2*c*(b*x+a))
))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn((1-I)*(exp(2*c*(b*x+a))-I)/(1+exp(2*c*(
b*x+a))))^2*exp(c*(b*x+a))
```

Maxima [A] time = 1.54006, size = 225, normalized size = 1.25

$$\frac{\operatorname{arccot}\left(\tanh\left(bcx+ac\right)\right)e^{\left(\left(bx+a\right)c\right)}}{bc}+\frac{\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\sqrt{2}+2\,e^{\left(bcx+ac\right)}\right)\right)}{2\,bc}+\frac{\sqrt{2}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2}-2\,e^{\left(bcx+ac\right)}\right)\right)}{2\,bc}-\frac{\sqrt{2}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(tanh(b*c*x+a*c)),x, algorithm="maxima")
```

```
[Out] arccot(tanh(b*c*x + a*c))*e^((b*x + a)*c)/(b*c) + 1/2*sqrt(2)*arctan(1/2*sq
rt(2)*(sqrt(2) + 2*e^(b*c*x + a*c)))/(b*c) + 1/2*sqrt(2)*arctan(-1/2*sqrt(2
)*(sqrt(2) - 2*e^(b*c*x + a*c)))/(b*c) - 1/4*sqrt(2)*log(sqrt(2)*e^(b*c*x +
 a*c) + e^(2*b*c*x + 2*a*c) + 1)/(b*c) + 1/4*sqrt(2)*log(-sqrt(2)*e^(b*c*x
+ a*c) + e^(2*b*c*x + 2*a*c) + 1)/(b*c)
```

Fricas [B] time = 2.788, size = 1153, normalized size = 6.41

$$-\frac{4\sqrt{2}bc\left(\frac{1}{b^4c^4}\right)^{\frac{1}{4}}\arctan\left(-\sqrt{2}bc\left(\frac{1}{b^4c^4}\right)^{\frac{1}{4}}e^{\left(bcx+ac\right)}+\sqrt{2}\sqrt{\sqrt{2}b^3c^3\left(\frac{1}{b^4c^4}\right)^{\frac{3}{4}}e^{\left(bcx+ac\right)}+b^2c^2\sqrt{\frac{1}{b^4c^4}}+e^{\left(2\,bcx+2\,ac\right)}}bc\left(\frac{1}{b^4c^4}\right)^{\frac{1}{4}}-1\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(tanh(b*c*x+a*c)),x, algorithm="fricas")
```

```
[Out] -1/4*(4*sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*arctan(-sqrt(2)*b*c*(1/(b^4*c^4))^(
1/4)*e^(b*c*x + a*c) + sqrt(2)*sqrt(sqrt(2)*b^3*c^3*(1/(b^4*c^4))^(3/4)*e^(
b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4)) + e^(2*b*c*x + 2*a*c))*b*c*(1/(b^4
*c^4))^(1/4) - 1) + 4*sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*arctan(-sqrt(2)*b*c*(
1/(b^4*c^4))^(1/4)*e^(b*c*x + a*c) + sqrt(2)*sqrt(-sqrt(2)*b^3*c^3*(1/(b^4*
c^4))^(3/4)*e^(b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4)) + e^(2*b*c*x + 2*a*
c))*b*c*(1/(b^4*c^4))^(1/4) + 1) + sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*log(sqrt
(2)*b^3*c^3*(1/(b^4*c^4))^(3/4)*e^(b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4))
 + e^(2*b*c*x + 2*a*c)) - sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*log(-sqrt(2)*b^3*
```

```
c^3*(1/(b^4*c^4))^(3/4)*e^(b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4)) + e^(2*
b*c*x + 2*a*c)) - 4*arctan((e^(2*b*c*x + 2*a*c) + 1)/(e^(2*b*c*x + 2*a*c) -
 1))*e^(b*c*x + a*c))/(b*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*acot(tanh(b*c*x+a*c)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.48529, size = 344, normalized size = 1.91

$$\frac{1}{4}\left(\frac{2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\sqrt{2}e^{(-ac)}+2e^{(bcx)}\right)e^{(ac)}\right)e^{(-11\,ac)}}{bc}+\frac{2\sqrt{2}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2}e^{(-ac)}-2e^{(bcx)}\right)e^{(ac)}\right)e^{(-11\,ac)}}{bc}-\frac{\sqrt{2}e^{(-11}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(tanh(b*c*x+a*c)),x, algorithm="giac")
```

```
[Out] 1/4*(2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*e^(-a*c) + 2*e^(b*c*x))*e^(a*c))
*e^(-11*a*c)/(b*c) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*e^(-a*c) - 2*e^
(b*c*x))*e^(a*c))*e^(-11*a*c)/(b*c) - sqrt(2)*e^(-11*a*c)*log(sqrt(2)*e^(b*
c*x - a*c) + e^(2*b*c*x) + e^(-2*a*c))/(b*c) + sqrt(2)*e^(-11*a*c)*log(-sqr
t(2)*e^(b*c*x - a*c) + e^(2*b*c*x) + e^(-2*a*c))/(b*c))*e^(11*a*c) + 1/4*(4
*pi*e^(b*c*x + a*c)*floor(1/4*(5*pi - 4*arctan(e^(-2*a*c)))/pi) - 3*pi*e^(b
*c*x + a*c) + 4*arctan(e^(-2*b*c*x - 2*a*c))*e^(b*c*x + a*c))/(b*c)
```

3.232 $\int e^{c(a+bx)} \cot^{-1}(\coth(ac+bcx))\,dx$

Optimal. Leaf size=180

$$-\frac{\log\left(e^{2c(a+bx)}-\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}+\frac{\log\left(e^{2c(a+bx)}+\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}+\frac{\tan^{-1}\left(1-\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc}-\frac{\tan^{-1}\left(\sqrt{2}e^{ac+bcx}+1\right)}{\sqrt{2}bc}+\frac{e^{a}}{}$$

```
[Out] (E^(a*c + b*c*x)*ArcCot[Coth[c*(a + b*x)]])/(b*c) + ArcTan[1 - Sqrt[2]*E^(a
*c + b*c*x)]/(Sqrt[2]*b*c) - ArcTan[1 + Sqrt[2]*E^(a*c + b*c*x)]/(Sqrt[2]*b
*c) - Log[1 + E^(2*c*(a + b*x)) - Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
+ Log[1 + E^(2*c*(a + b*x)) + Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
```

Rubi [A] time = 0.180084, antiderivative size = 180, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2194, 5208, 12, 2249, 297, 1162, 617, 204, 1165, 628}

$$-\frac{\log\left(e^{2c(a+bx)}-\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}+\frac{\log\left(e^{2c(a+bx)}+\sqrt{2}e^{ac+bcx}+1\right)}{2\sqrt{2}bc}+\frac{\tan^{-1}\left(1-\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc}-\frac{\tan^{-1}\left(\sqrt{2}e^{ac+bcx}+1\right)}{\sqrt{2}bc}+\frac{e^{a}}{}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c*(a + b*x))*ArcCot[Coth[a*c + b*c*x]],x]
```


```
[Out] (E^(a*c + b*c*x)*ArcCot[Coth[c*(a + b*x)]])/(b*c) + ArcTan[1 - Sqrt[2]*E^(a
*c + b*c*x)]/(Sqrt[2]*b*c) - ArcTan[1 + Sqrt[2]*E^(a*c + b*c*x)]/(Sqrt[2]*b
*c) - Log[1 + E^(2*c*(a + b*x)) - Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
+ Log[1 + E^(2*c*(a + b*x)) + Sqrt[2]*E^(a*c + b*c*x)]/(2*Sqrt[2]*b*c)
```


Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 2249

```
Int[((a_) + (b_.)*(F_)^((e_.)*((c_.) + (d_.)*(x_))))^(p_.)*(G_)^((h_.)*((f_
.) + (g_.)*(x_))), x_Symbol] :> With[{m = FullSimplify[(d*e*Log[F])/(g*h*Lo
g[G])]}, Dist[Denominator[m]/(g*h*Log[G]), Subst[Int[x^(Denominator[m] - 1)
*(a + b*F^(c*e - (d*e*f)/g)*x^Numerator[m])^p, x], x, G^((h*(f + g*x))/Deno
minator[m])], x] /; LtQ[m, -1] || GtQ[m, 1]] /; FreeQ[{F, G, a, b, c, d, e,
 f, g, h, p}, x]
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
```

```
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rubi steps

$$\int e^{c(a+bx)}\cot^{-1}(\coth(ac+bcx))\,dx = \frac{\text{Subst}\left(\int e^x\cot^{-1}(\coth(x))\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} + \frac{\text{Subst}\left(\int \frac{2e^{3x}}{-1-e^{4x}}\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} + \frac{2\,\text{Subst}\left(\int \frac{e^{3x}}{-1-e^{4x}}\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} + \frac{2\,\text{Subst}\left(\int \frac{x^2}{-1-x^4}\,dx,x,e^{ac+bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} - \frac{\text{Subst}\left(\int \frac{1-x^2}{-1-x^4}\,dx,x,e^{ac+bcx}\right)}{bc} + \frac{\text{Subst}\left(\int \frac{1+x^2}{-1-x^4}\right.}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} - \frac{\text{Subst}\left(\int \frac{1}{1-\sqrt{2}x+x^2}\,dx,x,e^{ac+bcx}\right)}{2bc} - \frac{\text{Subst}\left(\int \frac{}{1+}\right.}{}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} - \frac{\log\left(1-\sqrt{2}e^{ac+bcx}+e^{2ac+2bcx}\right)}{2\sqrt{2}bc} + \frac{\log\left(1+\sqrt{2}e^{ac}\right.}{2\sqrt{}}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\coth(c(a+bx)))}{bc} + \frac{\tan^{-1}\left(1-\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc} - \frac{\tan^{-1}\left(1+\sqrt{2}e^{ac+bcx}\right)}{\sqrt{2}bc}$$

Mathematica [C] time = 0.10875, size = 89, normalized size = 0.49

$$\frac{\text{RootSum}\left[\#1^4+1\&,\frac{-\log\left(e^{c(a+bx)}-\#1\right)+ac+bcx}{\#1}\&\right]+2e^{c(a+bx)}\cot^{-1}\left(\frac{e^{2c(a+bx)}+1}{e^{2c(a+bx)}-1}\right)}{2bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[E^(c*(a + b*x))*ArcCot[Coth[a*c + b*c*x]],x]
```

```
[Out] (2*E^(c*(a + b*x))*ArcCot[(1 + E^(2*c*(a + b*x)))/(-1 + E^(2*c*(a + b*x)))]
 + RootSum[1 + #1^4 & , (a*c + b*c*x - Log[E^(c*(a + b*x)) - #1])/#1 & ])/(
2*b*c)
```

Maple [C] time = 0.377, size = 1323, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*(b*x+a))*arccot(coth(b*c*x+a*c)),x)
```

```
[Out] 1/2*I/c/b*exp(c*(b*x+a))*ln(exp(2*c*(b*x+a))+I)+1/4/c/b*exp(c*(b*x+a))*Pi+1
/4/c/b*Pi*csgn(I/(exp(2*c*(b*x+a))-1))*csgn(I*(exp(2*c*(b*x+a))-I)/(exp(2*c
*(b*x+a))-1))^2*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I/(exp(2*c*(b*x+a))-1))*csgn
(I*(exp(2*c*(b*x+a))+I)/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a))+1/4/c/b*Pi*c
sgn(I*(exp(2*c*(b*x+a))-I))*csgn(I*(exp(2*c*(b*x+a))-I)/(exp(2*c*(b*x+a))-1
))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))-I)/(exp(2*c*(b*x+a)
)-1))*csgn((1+I)*(exp(2*c*(b*x+a))-I)/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a)
)-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I))*csgn(I*(exp(2*c*(b*x+a))+I)/(exp(
2*c*(b*x+a))-1))^2*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I)/(e
xp(2*c*(b*x+a))-1))*csgn((1-I)*(exp(2*c*(b*x+a))+I)/(exp(2*c*(b*x+a))-1))^2
*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))-I)/(exp(2*c*(b*x+a))-1)
)*csgn((1+I)*(exp(2*c*(b*x+a))-I)/(exp(2*c*(b*x+a))-1))*exp(c*(b*x+a))+1/4/
c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I)/(exp(2*c*(b*x+a))-1))*csgn((1-I)*(exp(2*
c*(b*x+a))+I)/(exp(2*c*(b*x+a))-1))*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(2
*c*(b*x+a))-I))*csgn(I/(exp(2*c*(b*x+a))-1))*csgn(I*(exp(2*c*(b*x+a))-I)/(e
xp(2*c*(b*x+a))-1))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I))*
csgn(I/(exp(2*c*(b*x+a))-1))*csgn(I*(exp(2*c*(b*x+a))+I)/(exp(2*c*(b*x+a))-
1))*exp(c*(b*x+a))+1/4/c/b*ln(exp(c*(b*x+a))+(1/2-1/2*I)*2^(1/2))*2^(1/2)-1
/4/c/b*ln(exp(c*(b*x+a))+(-1/2+1/2*I)*2^(1/2))*2^(1/2)-1/4/c/b*ln(exp(c*(b*
x+a))-(1/2+1/2*I)*2^(1/2))*2^(1/2)+1/4/c/b*ln(exp(c*(b*x+a))+(1/2+1/2*I)*2^
(1/2))*2^(1/2)-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))-I)/(exp(2*c*(b*x+a))-1))
^3*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+I)/(exp(2*c*(b*x+a))-
1))^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn((1-I)*(exp(2*c*(b*x+a))+I)/(exp(2*c*(b
*x+a))-1))^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn((1+I)*(exp(2*c*(b*x+a))-I)/(exp
(2*c*(b*x+a))-1))^3*exp(c*(b*x+a))+1/4/c/b*Pi*csgn((1-I)*(exp(2*c*(b*x+a))+
I)/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn((1+I)*(exp(2*c*(b
*x+a))-I)/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a))-1/2*I/c/b*exp(c*(b*x+a))*l
n(exp(2*c*(b*x+a))-I)-1/4*I/c/b*ln(exp(c*(b*x+a))+(1/2+1/2*I)*2^(1/2))*2^(1
```

```
/2)+1/4*I/c/b*ln(exp(c*(b*x+a))+(1/2-1/2*I)*2^(1/2))*2^(1/2)-1/4*I/c/b*ln(e
xp(c*(b*x+a))+(-1/2+1/2*I)*2^(1/2))*2^(1/2)+1/4*I/c/b*ln(exp(c*(b*x+a))-(1/
2+1/2*I)*2^(1/2))*2^(1/2)
```

Maxima [A] time = 1.54334, size = 225, normalized size = 1.25

$$\frac{\operatorname{arccot}\left(\coth\left(bcx+ac\right)\right)e^{\left((bx+a)c\right)}}{bc}-\frac{\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\sqrt{2}+2\,e^{(bcx+ac)}\right)\right)}{2\,bc}-\frac{\sqrt{2}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2}-2\,e^{(bcx+ac)}\right)\right)}{2\,bc}+\frac{\sqrt{2}\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(coth(b*c*x+a*c)),x, algorithm="maxima")
```

```
[Out] arccot(coth(b*c*x + a*c))*e^((b*x + a)*c)/(b*c) - 1/2*sqrt(2)*arctan(1/2*sq
rt(2)*(sqrt(2) + 2*e^(b*c*x + a*c)))/(b*c) - 1/2*sqrt(2)*arctan(-1/2*sqrt(2
)*(sqrt(2) - 2*e^(b*c*x + a*c)))/(b*c) + 1/4*sqrt(2)*log(sqrt(2)*e^(b*c*x +
 a*c) + e^(2*b*c*x + 2*a*c) + 1)/(b*c) - 1/4*sqrt(2)*log(-sqrt(2)*e^(b*c*x
+ a*c) + e^(2*b*c*x + 2*a*c) + 1)/(b*c)
```

Fricas [B] time = 2.6424, size = 1152, normalized size = 6.4

$$\frac{4\sqrt{2}bc\left(\frac{1}{b^4c^4}\right)^{\frac{1}{4}}\arctan\left(-\sqrt{2}bc\left(\frac{1}{b^4c^4}\right)^{\frac{1}{4}}e^{(bcx+ac)}+\sqrt{2}\sqrt{\sqrt{2}b^3c^3\left(\frac{1}{b^4c^4}\right)^{\frac{3}{4}}e^{(bcx+ac)}+b^2c^2\sqrt{\frac{1}{b^4c^4}}+e^{(2\,bcx+2\,ac)}}bc\left(\frac{1}{b^4c^4}\right)^{\frac{1}{4}}-1\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(coth(b*c*x+a*c)),x, algorithm="fricas")
```

```
[Out] 1/4*(4*sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*arctan(-sqrt(2)*b*c*(1/(b^4*c^4))^(1
/4)*e^(b*c*x + a*c) + sqrt(2)*sqrt(sqrt(2)*b^3*c^3*(1/(b^4*c^4))^(3/4)*e^(b
*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4)) + e^(2*b*c*x + 2*a*c))*b*c*(1/(b^4*
c^4))^(1/4) - 1) + 4*sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*arctan(-sqrt(2)*b*c*(1
/(b^4*c^4))^(1/4)*e^(b*c*x + a*c) + sqrt(2)*sqrt(-sqrt(2)*b^3*c^3*(1/(b^4*c
^4))^(3/4)*e^(b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4)) + e^(2*b*c*x + 2*a*c
))*b*c*(1/(b^4*c^4))^(1/4) + 1) + sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*log(sqrt(
2)*b^3*c^3*(1/(b^4*c^4))^(3/4)*e^(b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4))
+ e^(2*b*c*x + 2*a*c)) - sqrt(2)*b*c*(1/(b^4*c^4))^(1/4)*log(-sqrt(2)*b^3*c
```

```
^3*(1/(b^4*c^4))^(3/4)*e^(b*c*x + a*c) + b^2*c^2*sqrt(1/(b^4*c^4)) + e^(2*b
*c*x + 2*a*c)) + 4*arctan((e^(2*b*c*x + 2*a*c) - 1)/(e^(2*b*c*x + 2*a*c) +
1))*e^(b*c*x + a*c))/(b*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*acot(coth(b*c*x+a*c)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.5302, size = 344, normalized size = 1.91

$$-\frac{1}{4}\left(\frac{2\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\sqrt{2}e^{(-ac)}+2e^{(bcx)}\right)e^{(ac)}\right)e^{(-11\,ac)}}{bc}+\frac{2\sqrt{2}\arctan\left(-\frac{1}{2}\sqrt{2}\left(\sqrt{2}e^{(-ac)}-2e^{(bcx)}\right)e^{(ac)}\right)e^{(-11\,ac)}}{bc}-\frac{\sqrt{2}e^{(-1}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(coth(b*c*x+a*c)),x, algorithm="giac")
```

```
[Out] -1/4*(2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*e^(-a*c) + 2*e^(b*c*x))*e^(a*c)
)*e^(-11*a*c)/(b*c) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*e^(-a*c) - 2*e
^(b*c*x))*e^(a*c))*e^(-11*a*c)/(b*c) - sqrt(2)*e^(-11*a*c)*log(sqrt(2)*e^(b
*c*x - a*c) + e^(2*b*c*x) + e^(-2*a*c))/(b*c) + sqrt(2)*e^(-11*a*c)*log(-sq
rt(2)*e^(b*c*x - a*c) + e^(2*b*c*x) + e^(-2*a*c))/(b*c))*e^(11*a*c) - 1/4*(
4*pi*e^(b*c*x + a*c)*floor(1/4*(3*pi - 4*arctan(e^(-2*a*c)))/pi) - pi*e^(b*
c*x + a*c) + 4*arctan(e^(-2*b*c*x - 2*a*c))*e^(b*c*x + a*c))/(b*c)
```

3.233 $\int e^{c(a+bx)} \cot^{-1}(\operatorname{sech}(ac+bcx))\,dx$

Optimal. Leaf size=103

$$-\frac{\left(1-\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3-2\sqrt{2}\right)}{2bc}-\frac{\left(1+\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3+2\sqrt{2}\right)}{2bc}+\frac{e^{ac+bcx}\cot^{-1}(\operatorname{sech}(c(a+bx)))}{bc}$$

```
[Out] (E^(a*c + b*c*x)*ArcCot[Sech[c*(a + b*x)]])/(b*c) - ((1 - Sqrt[2])*Log[3 -
2*Sqrt[2] + E^(2*c*(a + b*x))])/(2*b*c) - ((1 + Sqrt[2])*Log[3 + 2*Sqrt[2]
+ E^(2*c*(a + b*x))])/(2*b*c)
```

Rubi [A] time = 0.150956, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {2194, 5208, 2282, 12, 1247, 632, 31}

$$-\frac{\left(1-\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3-2\sqrt{2}\right)}{2bc}-\frac{\left(1+\sqrt{2}\right)\log\left(e^{2c(a+bx)}+3+2\sqrt{2}\right)}{2bc}+\frac{e^{ac+bcx}\cot^{-1}(\operatorname{sech}(c(a+bx)))}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c*(a + b*x))*ArcCot[Sech[a*c + b*c*x]],x]
```

```
[Out] (E^(a*c + b*c*x)*ArcCot[Sech[c*(a + b*x)]])/(b*c) - ((1 - Sqrt[2])*Log[3 -
2*Sqrt[2] + E^(2*c*(a + b*x))])/(2*b*c) - ((1 + Sqrt[2])*Log[3 + 2*Sqrt[2]
+ E^(2*c*(a + b*x))])/(2*b*c)
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 632

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> W
ith[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(c*d - e*(b/2 - q/2))/q, Int[1/(b/2 - q/
2 + c*x), x], x] - Dist[(c*d - e*(b/2 + q/2))/q, Int[1/(b/2 + q/2 + c*x), x
], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[2*c*d - b*e, 0] && NeQ[b^2 - 4*a
*c, 0] && NiceSqrtQ[b^2 - 4*a*c]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int e^{c(a+bx)}\cot^{-1}(\text{sech}(ac+bcx))\,dx = \frac{\text{Subst}\left(\int e^x\cot^{-1}(\text{sech}(x))\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\text{sech}(c(a+bx)))}{bc} - \frac{\text{Subst}\left(\int \frac{e^x\text{sech}(x)\tanh(x)}{1+\text{sech}^2(x)}\,dx,x,ac+bcx\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\text{sech}(c(a+bx)))}{bc} - \frac{\text{Subst}\left(\int \frac{2x(-1+x^2)}{1+6x^2+x^4}\,dx,x,e^{ac+bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\text{sech}(c(a+bx)))}{bc} - \frac{2\,\text{Subst}\left(\int \frac{x(-1+x^2)}{1+6x^2+x^4}\,dx,x,e^{ac+bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\text{sech}(c(a+bx)))}{bc} - \frac{\text{Subst}\left(\int \frac{-1+x}{1+6x+x^2}\,dx,x,e^{2ac+2bcx}\right)}{bc}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\text{sech}(c(a+bx)))}{bc} - \frac{\left(1-\sqrt{2}\right)\text{Subst}\left(\int \frac{1}{3-2\sqrt{2}+x}\,dx,x,e^{2ac+2bcx}\right)}{2bc} - \frac{(1}{}$$
$$= \frac{e^{ac+bcx}\cot^{-1}(\text{sech}(c(a+bx)))}{bc} - \frac{\left(1-\sqrt{2}\right)\log\left(3-2\sqrt{2}+e^{2ac+2bcx}\right)}{2bc} - \frac{\left(1+\sqrt{2}\right)\text{l}}{}$$

Mathematica [C] time = 0.147141, size = 145, normalized size = 1.41

$$\frac{\text{RootSum}\left[\#1^4+6\#1^2+1\&,\frac{-7\#1^2\log\left(e^{c(a+bx)}-\#1\right)+7\#1^2ac+7\#1^2bcx-\log\left(e^{c(a+bx)}-\#1\right)+ac+bcx}{3\#1^2+1}\&\right]-4c(a+bx)+2e^{c(a+bx)}\cot^{-1}\left(\frac{2e}{e^{2c(}}\right.}{2bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[E^(c*(a + b*x))*ArcCot[Sech[a*c + b*c*x]],x]
```

```
[Out] (-4*c*(a + b*x) + 2*E^(c*(a + b*x))*ArcCot[(2*E^(c*(a + b*x)))/(1 + E^(2*c*
(a + b*x)))] + RootSum[1 + 6*#1^2 + #1^4 & , (a*c + b*c*x - Log[E^(c*(a + b
*x)) - #1] + 7*a*c*#1^2 + 7*b*c*x*#1^2 - 7*Log[E^(c*(a + b*x)) - #1]*#1^2)/
(1 + 3*#1^2) & ])/(2*b*c)
```

Maple [C] time = 0.356, size = 859, normalized size = 8.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*(b*x+a))*arccot(sech(b*c*x+a*c)),x)
```

```
[Out] -1/2*I/c/b*exp(c*(b*x+a))*ln(exp(2*c*(b*x+a))+1-2*I*exp(c*(b*x+a)))+1/4/c/b
*Pi*csgn(I*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a)))/(1+exp(2*c*(b*x+a))))^3
*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))
*csgn(I*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a)))/(1+exp(2*c*(b*x+a))))^2*ex
p(c*(b*x+a))+1/4/c/b*Pi*csgn(I/(1+exp(2*c*(b*x+a))))*csgn(I*(-exp(2*c*(b*x+
a))-1+2*I*exp(c*(b*x+a)))/(1+exp(2*c*(b*x+a))))^2*exp(c*(b*x+a))-1/4/c/b*Pi
*csgn(I*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a))))*csgn(I/(1+exp(2*c*(b*x+a)
)))*csgn(I*(-exp(2*c*(b*x+a))-1+2*I*exp(c*(b*x+a)))/(1+exp(2*c*(b*x+a))))*e
xp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))*cs
gn(I*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a)))/(1+exp(2*c*(b*x+a))))^2*exp(c*
(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a))))*csgn(I/
(1+exp(2*c*(b*x+a))))*csgn(I*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a)))/(1+exp
(2*c*(b*x+a))))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(2*c*(b*x+a))+1+2*I*ex
p(c*(b*x+a)))/(1+exp(2*c*(b*x+a))))^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I/(1+e
xp(2*c*(b*x+a))))*csgn(I*(exp(2*c*(b*x+a))+1+2*I*exp(c*(b*x+a)))/(1+exp(2*c
*(b*x+a))))^2*exp(c*(b*x+a))+1/2*I/c/b*exp(c*(b*x+a))*ln(exp(2*c*(b*x+a))+1
+2*I*exp(c*(b*x+a)))+1/2/c/b*exp(c*(b*x+a))*Pi+1/2/c/b*ln(exp(2*c*(b*x+a))+
(2^(1/2)-1)^2)*2^(1/2)-1/2/c/b*ln(exp(2*c*(b*x+a))+(1+2^(1/2))^2)*2^(1/2)+2
*a/b-1/2/c/b*ln(exp(2*c*(b*x+a))+(2^(1/2)-1)^2)-1/2/c/b*ln(exp(2*c*(b*x+a))
+(1+2^(1/2))^2)
```

Maxima [A] time = 1.57742, size = 228, normalized size = 2.21

$$\frac{\operatorname{arccot}\left(\operatorname{sech}\left(bcx+ac\right)\right)e^{\left(\left(bx+a\right)c\right)}}{bc}+\frac{3\sqrt{2}\log\left(-\frac{2\sqrt{2}-e^{\left(2\,bcx+2\,ac\right)}-3}{2\sqrt{2}+e^{\left(2\,bcx+2\,ac\right)}+3}\right)}{8\,bc}-\frac{\sqrt{2}\log\left(-\frac{2\sqrt{2}-e^{\left(-2\,bcx-2\,ac\right)}-3}{2\sqrt{2}+e^{\left(-2\,bcx-2\,ac\right)}+3}\right)}{8\,bc}-\frac{\log\left(e^{\left(4\,bcx+4\,ac\right)}+6\,e^{\left(2\,b\right.}\right.}{2\,bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(sech(b*c*x+a*c)),x, algorithm="maxima")
```

```
[Out] arccot(sech(b*c*x + a*c))*e^((b*x + a)*c)/(b*c) + 3/8*sqrt(2)*log(-(2*sqrt(
2) - e^(2*b*c*x + 2*a*c) - 3)/(2*sqrt(2) + e^(2*b*c*x + 2*a*c) + 3))/(b*c)
- 1/8*sqrt(2)*log(-(2*sqrt(2) - e^(-2*b*c*x - 2*a*c) - 3)/(2*sqrt(2) + e^(-
2*b*c*x - 2*a*c) + 3))/(b*c) - 1/2*log(e^(4*b*c*x + 4*a*c) + 6*e^(2*b*c*x +
 2*a*c) + 1)/(b*c)
```

Fricas [B] time = 2.75424, size = 591, normalized size = 5.74

$$\frac{2 (\cosh (bcx + ac) + \sinh (bcx + ac)) \arctan (\cosh (bcx + ac)) + \sqrt{2} \log \left(-\frac{3 (2 \sqrt{2} - 3) \cosh(bcx+ac)^2 - 4 (3 \sqrt{2} - 4) \cosh(bcx+ac) \sinh(}{\cosh(bcx+ac)^2 + \sinh(bc} \right.}{2 bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(sech(b*c*x+a*c)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(cosh(b*c*x + a*c) + sinh(b*c*x + a*c))*arctan(cosh(b*c*x + a*c)) +
sqrt(2)*log(-(3*(2*sqrt(2) - 3)*cosh(b*c*x + a*c)^2 - 4*(3*sqrt(2) - 4)*cos
h(b*c*x + a*c)*sinh(b*c*x + a*c) + 3*(2*sqrt(2) - 3)*sinh(b*c*x + a*c)^2 +
2*sqrt(2) - 3)/(cosh(b*c*x + a*c)^2 + sinh(b*c*x + a*c)^2 + 3)) - log(2*(co
sh(b*c*x + a*c)^2 + sinh(b*c*x + a*c)^2 + 3)/(cosh(b*c*x + a*c)^2 - 2*cosh(
b*c*x + a*c)*sinh(b*c*x + a*c) + sinh(b*c*x + a*c)^2)))/(b*c)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*acot(sech(b*c*x+a*c)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.1401, size = 208, normalized size = 2.02

$$\frac{\left(\sqrt{2} e^{(-ac)} \log \left(-\frac{2 \sqrt{2} e^{(2 ac)} - e^{(2 bcx + 4 ac)} - 3 e^{(2 ac)}}{2 \sqrt{2} e^{(2 ac)} + e^{(2 bcx + 4 ac)} + 3 e^{(2 ac)}}\right) + 2 \arctan \left(\frac{1}{2} e^{(bcx+ac)} + \frac{1}{2} e^{(-bcx-ac)}\right) e^{(bcx)} - e^{(-ac)} \log \left(e^{(4 bcx + 4 ac)} + 6 e^{(2 bcx + 2 a}\right.\right.}{2 bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(sech(b*c*x+a*c)),x, algorithm="giac")
```

```
[Out] 1/2*(sqrt(2)*e^(-a*c)*log(-(2*sqrt(2)*e^(2*a*c) - e^(2*b*c*x + 4*a*c) - 3*e
^(2*a*c))/(2*sqrt(2)*e^(2*a*c) + e^(2*b*c*x + 4*a*c) + 3*e^(2*a*c))) + 2*ar
ctan(1/2*e^(b*c*x + a*c) + 1/2*e^(-b*c*x - a*c))*e^(b*c*x) - e^(-a*c)*log(e
^(4*b*c*x + 4*a*c) + 6*e^(2*b*c*x + 2*a*c) + 1))*e^(a*c)/(b*c)
```

3.234 $\int e^{c(a+bx)} \cot^{-1}(\mathbf{csch}(ac + bcx))\, dx$

Optimal. Leaf size=48

$$\frac{e^{ac+bcx}\cot^{-1}(\text{csch}(c(a+bx)))}{bc} - \frac{\log\left(e^{2c(a+bx)}+1\right)}{bc}$$

```
[Out] (E^(a*c + b*c*x)*ArcCot[Csch[c*(a + b*x)]])/(b*c) - Log[1 + E^(2*c*(a + b*x
))]/(b*c)
```

Rubi [A] time = 0.0773401, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {2194, 5208, 2282, 12, 260}

$$\frac{e^{ac+bcx}\cot^{-1}(\text{csch}(c(a+bx)))}{bc} - \frac{\log\left(e^{2c(a+bx)}+1\right)}{bc}$$

Antiderivative was successfully verified.

```
[In] Int[E^(c*(a + b*x))*ArcCot[Csch[a*c + b*c*x]],x]
```

```
[Out] (E^(a*c + b*c*x)*ArcCot[Csch[c*(a + b*x)]])/(b*c) - Log[1 + E^(2*c*(a + b*x
))]/(b*c)
```

Rule 2194

```
Int[((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.), x_Symbol] :> Simp[(F^(c*(a +
 b*x)))^n/(b*c*n*Log[F]), x] /; FreeQ[{F, a, b, c, n}, x]
```

Rule 5208

```
Int[((a_.) + ArcCot[u_]*(b_.))*(v_), x_Symbol] :> With[{w = IntHide[v, x]},
 Dist[a + b*ArcCot[u], w, x] + Dist[b, Int[SimplifyIntegrand[(w*D[u, x])/(1
 + u^2), x], x], x] /; InverseFunctionFreeQ[w, x]] /; FreeQ[{a, b}, x] && I
nverseFunctionFreeQ[u, x] &&  !MatchQ[v, ((c_.) + (d_.)*x)^(m_.) /; FreeQ[{
c, d, m}, x]] && FalseQ[FunctionOfLinear[v*(a + b*ArcCot[u]), x]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}\int e^{c(a+bx)}\cot^{-1}(\operatorname{csch}(ac+bcx))\,dx &= \frac{\operatorname{Subst}\left(\int e^x\cot^{-1}(\operatorname{csch}(x))\,dx,x,ac+bcx\right)}{bc}\\ &= \frac{e^{ac+bcx}\cot^{-1}(\operatorname{csch}(c(a+bx)))}{bc}-\frac{\operatorname{Subst}\left(\int e^x\operatorname{sech}(x)\,dx,x,ac+bcx\right)}{bc}\\ &= \frac{e^{ac+bcx}\cot^{-1}(\operatorname{csch}(c(a+bx)))}{bc}-\frac{\operatorname{Subst}\left(\int\frac{2x}{1+x^2}\,dx,x,e^{ac+bcx}\right)}{bc}\\ &= \frac{e^{ac+bcx}\cot^{-1}(\operatorname{csch}(c(a+bx)))}{bc}-\frac{2\operatorname{Subst}\left(\int\frac{x}{1+x^2}\,dx,x,e^{ac+bcx}\right)}{bc}\\ &= \frac{e^{ac+bcx}\cot^{-1}(\operatorname{csch}(c(a+bx)))}{bc}-\frac{\log\left(1+e^{2c(a+bx)}\right)}{bc}\end{aligned}$$

Mathematica [A] time = 0.0929313, size = 59, normalized size = 1.23

$$\frac{e^{c(a+bx)}\cot^{-1}\left(\frac{2e^{c(a+bx)}}{e^{2c(a+bx)}-1}\right)-\log\left(e^{2c(a+bx)}+1\right)}{bc}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[E^(c*(a + b*x))*ArcCot[Csch[a*c + b*c*x]],x]
```

```
[Out] (E^(c*(a + b*x))*ArcCot[(2*E^(c*(a + b*x)))/(-1 + E^(2*c*(a + b*x)))] - Log
[1 + E^(2*c*(a + b*x))])/(b*c)
```

Maple [C] time = 0.307, size = 903, normalized size = 18.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(exp(c*(b*x+a))*arccot(csch(b*c*x+a*c)),x)
```

```
[Out] I/c/b*exp(c*(b*x+a))*ln(exp(c*(b*x+a))+I)-1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))
-I)^2/(exp(2*c*(b*x+a))-1))^3*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(c*(b*x+
a))-I)^2)*csgn(I*(exp(c*(b*x+a))-I)^2/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a)
)+1/4/c/b*Pi*csgn(I/(exp(2*c*(b*x+a))-1))*csgn(I*(exp(c*(b*x+a))-I)^2/(exp(
2*c*(b*x+a))-1))^2*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))-I)^2)*c
sgn(I/(exp(2*c*(b*x+a))-1))*csgn(I*(exp(c*(b*x+a))-I)^2/(exp(2*c*(b*x+a))-1
))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I))^2*csgn(I*(exp(c*(b*
x+a))+I)^2)*exp(c*(b*x+a))-1/2/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I))*csgn(I*(ex
p(c*(b*x+a))+I)^2)^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I)^2)
^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I)^2)*csgn(I*(exp(c*(b*
x+a))+I)^2/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(c*
(b*x+a))+I)^2)*csgn(I/(exp(2*c*(b*x+a))-1))*csgn(I*(exp(c*(b*x+a))+I)^2/(ex
p(2*c*(b*x+a))-1))*exp(c*(b*x+a))+1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))+I)^2/(e
xp(2*c*(b*x+a))-1))^3*exp(c*(b*x+a))-1/4/c/b*Pi*csgn(I/(exp(2*c*(b*x+a))-1)
)*csgn(I*(exp(c*(b*x+a))+I)^2/(exp(2*c*(b*x+a))-1))^2*exp(c*(b*x+a))-1/4/c/
b*Pi*csgn(I*(exp(c*(b*x+a))-I))^2*csgn(I*(exp(c*(b*x+a))-I)^2)*exp(c*(b*x+a
))+1/2/c/b*Pi*csgn(I*(exp(c*(b*x+a))-I))*csgn(I*(exp(c*(b*x+a))-I)^2)^2*exp
(c*(b*x+a))-1/4/c/b*Pi*csgn(I*(exp(c*(b*x+a))-I)^2)^3*exp(c*(b*x+a))-I/c/b*
exp(c*(b*x+a))*ln(exp(c*(b*x+a))-I)+1/2/c/b*exp(c*(b*x+a))*Pi+2*a/b-ln(1+ex
p(2*c*(b*x+a)))/b/c
```

Maxima [A] time = 1.52135, size = 65, normalized size = 1.35

$$\frac{\operatorname{arccot}\left(\operatorname{csch}\left(bcx+ac\right)\right)e^{\left(\left(bx+a\right)c\right)}}{bc}-\frac{\log\left(e^{\left(2\,bcx+2\,ac\right)}+1\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(csch(b*c*x+a*c)),x, algorithm="maxima")
```

```
[Out] arccot(csch(b*c*x + a*c))*e^((b*x + a)*c)/(b*c) - log(e^(2*b*c*x + 2*a*c) +
 1)/(b*c)
```

Fricas [A] time = 2.48685, size = 192, normalized size = 4.

$$\frac{\left(\cosh\left(bcx+ac\right)+\sinh\left(bcx+ac\right)\right)\arctan\left(\sinh\left(bcx+ac\right)\right)-\log\left(\frac{2\cosh(bcx+ac)}{\cosh(bcx+ac)-\sinh(bcx+ac)}\right)}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(csch(b*c*x+a*c)),x, algorithm="fricas")
```

```
[Out] ((cosh(b*c*x + a*c) + sinh(b*c*x + a*c))*arctan(sinh(b*c*x + a*c)) - log(2*
cosh(b*c*x + a*c)/(cosh(b*c*x + a*c) - sinh(b*c*x + a*c))))/(b*c)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$e^{ac}\int e^{bcx}\operatorname{acot}\left(\operatorname{csch}\left(ac+bcx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*acot(csch(b*c*x+a*c)),x)
```

```
[Out] exp(a*c)*Integral(exp(b*c*x)*acot(csch(a*c + b*c*x)), x)
```

Giac [A] time = 1.13233, size = 88, normalized size = 1.83

$$\frac{\left(\arctan\left(\frac{1}{2}e^{(bcx+ac)}-\frac{1}{2}e^{(-bcx-ac)}\right)e^{(bcx)}-e^{(-ac)}\log\left(e^{(2bcx+2ac)}+1\right)\right)e^{(ac)}}{bc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(exp(c*(b*x+a))*arccot(csch(b*c*x+a*c)),x, algorithm="giac")
```

```
[Out] (arctan(1/2*e^(b*c*x + a*c) - 1/2*e^(-b*c*x - a*c))*e^(b*c*x) - e^(-a*c)*lo
g(e^(2*b*c*x + 2*a*c) + 1))*e^(a*c)/(b*c)
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
```

```
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems
```

```

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
```

```
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
```

```
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
```

```
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
```

```
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
```

```
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
```

```
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,
    Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
    well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
```

```
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

def tree(expr):
    debug=False;
    if debug:
         print ("Enter tree(expr), expr=",expr)
         print ("expr.operator()=",expr.operator())
         print ("expr.operands()=",expr.operands())
         print ("map(tree, expr.operands()=",map(tree, expr.operands()))

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

def leaf_count(anti):
    debug=False;

    if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))

    if len(anti) == 0: #special check for optimal being 0 for some test cases.
       if debug: print ("len(anti) == 0")
       return 1
    else:
        if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len(
    flatten(tree(anti)))))
        return round(1.35*len(flatten(tree(anti)))) #fudge factor
                     #since this estimate of leaf count is bit lower than
                     #what it should be compared to Mathematica's

def is_sqrt(expr):
    debug=False;
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

```

```
def is_elementary_function(func):
    debug = False

    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug = False

    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
    sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U
    ']

def is_appell_function(func):
```

```
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath

def is_atom(expn):

    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):
    debug=False

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
                return 1
```

```
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):
    debug = False;

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, " leaf_count_optimal=",leaf_count_optimal)
```

```
    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
   expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```