Computer algebra independent integration tests

4-Trig-functions/4.4-Cotangent/4.4.2.1-a+b-cot-^m-c+d-cot-^n

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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 [106]. This is test number [112].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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	% 100.00 (106)	% 0.00 (0)
Mathematica	% 99.06 (105)	% 0.94 (1)
Maple	% 97.17 (103)	% 2.83 (3)
Maxima	% 74.53 (79)	% 25.47 (27)
Fricas	% 29.25 (31)	% 70.75 (75)
Sympy	% 1.89 (2)	% 98.11 (104)
Giac	% 2.83 (3)	% 97.17 (103)
Mupad	% 97.17 (103)	% 2.83 (3)

Table 1.1: Percentage solved for each CAS

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.

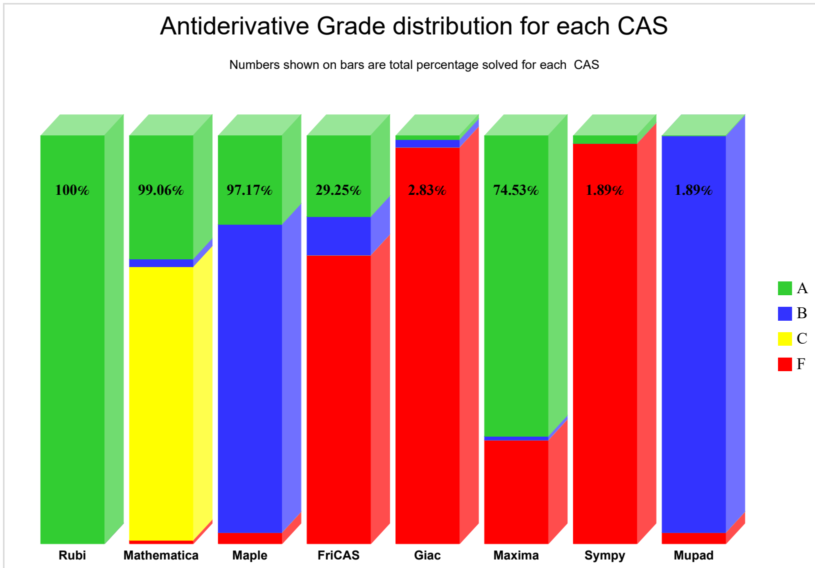
Table 1.2: Description of grading applied to integration result

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

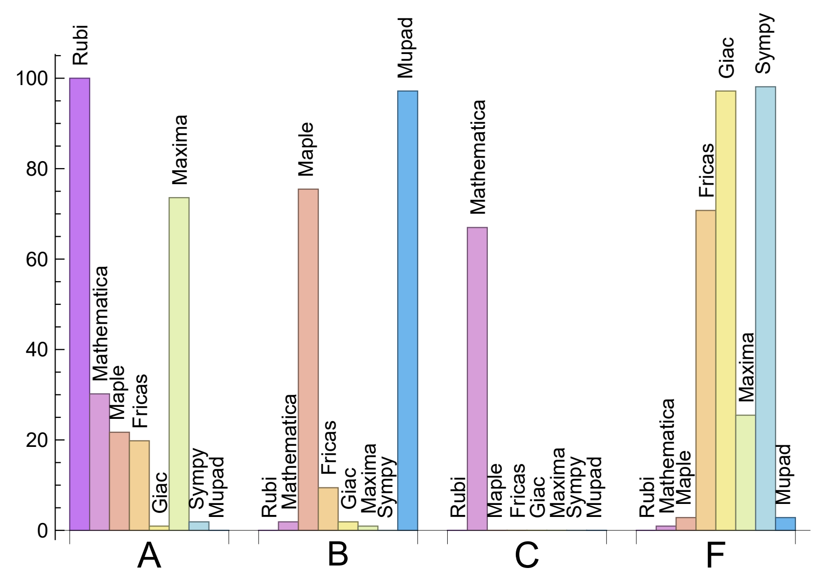
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	30.19	1.89	66.98	0.94
Maple	21.70	75.47	0.00	2.83
Maxima	73.58	0.94	0.00	25.47
Fricas	19.81	9.43	0.00	70.75
Sympy	1.89	0.00	0.00	98.11
Giac	0.94	1.89	0.00	97.17
Mupad	0.00	97.17	0.00	2.83

Table 1.3: Antiderivative Grade distribution of each CAS

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.



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

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

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

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	1	100.00 %	0.00 %	0.00 %
Maple	3	100.00 %	0.00 %	0.00 %
Maxima	27	88.89 %	11.11 %	0.00 %
Fricas	75	4.00 %	78.67 %	17.33 %
Sympy	104	95.19 %	3.85 %	0.96 %
Giac	103	100.00 %	0.00 %	0.00 %
Mupad	3	100.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

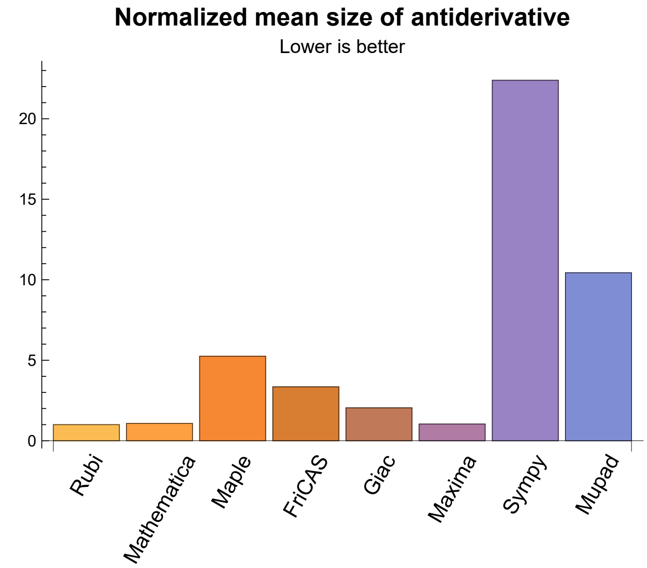
1.3 Performance

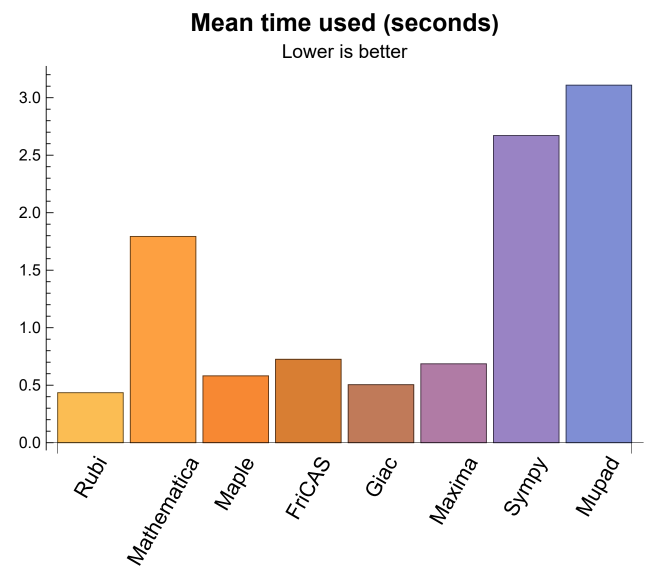
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.43	232.98	1.00	221.50	1.00
Mathematica	1.79	212.17	1.07	193.00	0.86
Maple	0.58	863.94	5.25	434.00	2.32
Maxima	0.69	247.84	1.04	231.00	0.92
Fricas	0.73	402.06	3.35	377.00	3.34
Sympy	2.67	2250.00	22.39	2250.00	22.39
Giac	0.50	249.33	2.05	241.00	2.17
Mupad	3.11	3189.42	10.43	366.00	1.69

Table 1.5: Time and leaf size performance for each CAS

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





1.4 list of integrals that has no closed form antiderivative

{}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

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 {}

Mathematica {81}

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.

Mupad 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 14 such integrals out of total 705, or about 2 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. The exception message will indicate of the error is due to the interactive question being asked or not.

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 for Fricas and Sympy and Giac antiderivatives is determined using the following function, thanks to user `slelievre` at https://

ask.sagemath.org/question/57123/could-we-have-a-leaf_count-function-in-base-sagemath/

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

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

```
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
```

1.9.4 Important note about Mupad results

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

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

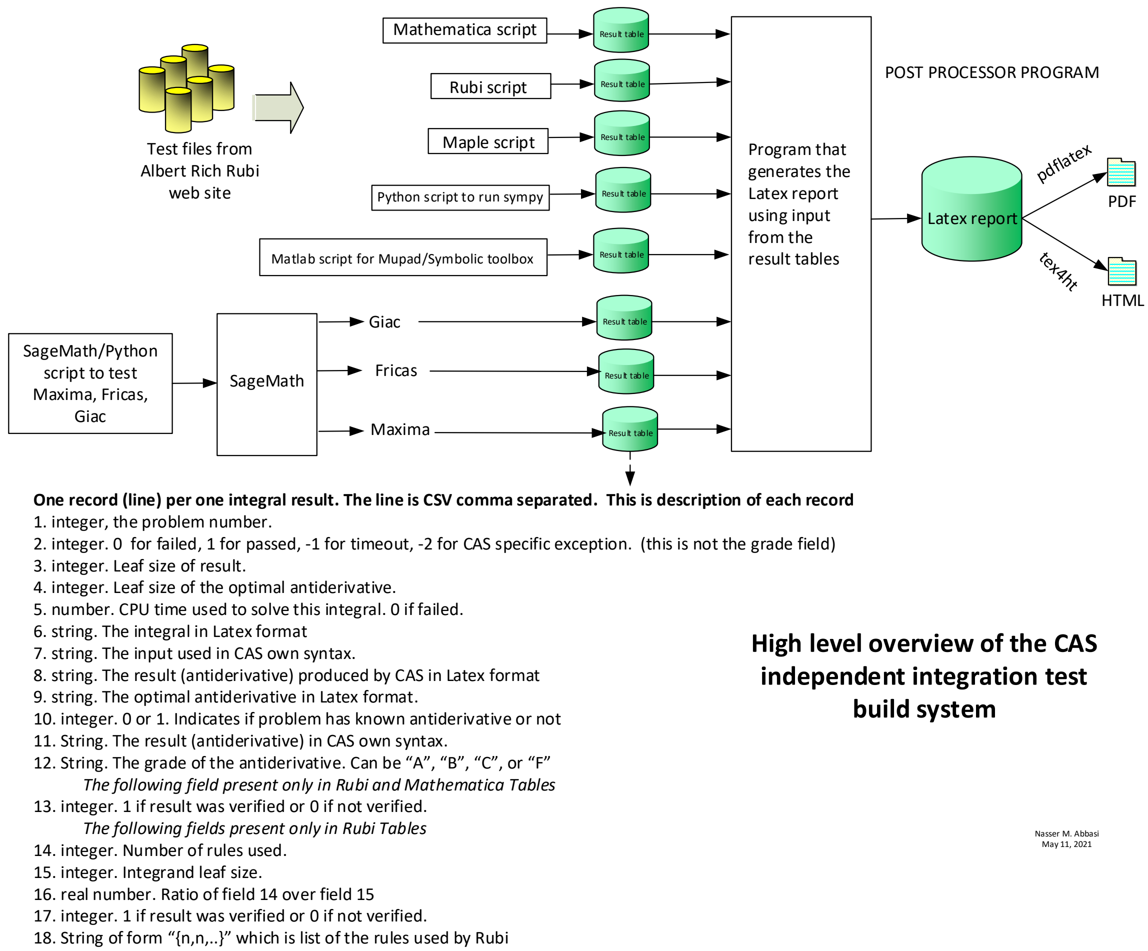
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



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 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 8, 10, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 90, 91, 92, 96, 97, 98, 101, 102, 103, 104, 105, 106 }

B grade: { 1, 95 }

C grade: { 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 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, 93, 94, 99, 100 }

F grade: { 89 }

2.1.3 Maple

A grade: { 8, 9, 10, 11, 12, 13, 14, 29, 30, 31, 32, 33, 34, 51, 52, 54, 55, 69, 70, 71, 72, 73, 74 }

B grade: { 2, 3, 4, 5, 6, 7, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 53, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 }

C grade: { }

F grade: { 1, 88, 89 }

2.1.4 Maxima

A grade: { 2, 3, 4, 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, 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, 92, 93, 94 }

B grade: { 5 }

C grade: { }

F grade: { 1, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 88, 89, 90, 91, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 }

2.1.5 FriCAS

A grade: { 2, 4, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 35, 36, 37, 38, 40, 92 }

B grade: { 3, 5, 6, 7, 27, 39, 90, 91, 93, 94 }

C grade: { }

F grade: { 1, 8, 9, 10, 11, 12, 13, 14, 29, 30, 31, 32, 33, 34, 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, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 }

2.1.6 Sympy

A grade: { 92, 93 }

B grade: { }

C grade: { }

F 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, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 }

2.1.7 Giac

A grade: { 92 }

B grade: { 93, 94 }

C grade: { }

F 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, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 }

2.1.8 Mupad

A grade: { }

B grade: { 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, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106 }

C grade: { }

F grade: { 1, 88, 89 }

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	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	117	0	0	0	0	0	-1
normalized size	1	1.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.028	0.322	2.502	0.000	0.861	0.000	0.000	0.000

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	68	388	149	377	0	0	144
normalized size	1	1.00	0.59	3.34	1.28	3.25	0.00	0.00	1.24
time (sec)	N/A	0.157	0.187	0.495	0.760	0.902	0.000	0.000	1.978

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	67	363	124	334	0	0	98
normalized size	1	1.00	0.71	3.86	1.32	3.55	0.00	0.00	1.04
time (sec)	N/A	0.116	0.112	0.427	0.616	0.750	0.000	0.000	1.161

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	154	337	108	236	0	0	128
normalized size	1	1.00	2.17	4.75	1.52	3.32	0.00	0.00	1.80
time (sec)	N/A	0.078	0.289	0.431	0.896	0.650	0.000	0.000	0.777

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	165	327	83	172	0	0	65
normalized size	1	1.00	3.37	6.67	1.69	3.51	0.00	0.00	1.33
time (sec)	N/A	0.044	0.217	0.430	0.692	0.601	0.000	0.000	0.728

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	191	355	111	321	0	0	84
normalized size	1	1.00	2.55	4.73	1.48	4.28	0.00	0.00	1.12
time (sec)	N/A	0.086	0.259	0.359	0.719	0.533	0.000	0.000	0.960

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	203	374	123	358	0	0	103
normalized size	1	1.00	2.05	3.78	1.24	3.62	0.00	0.00	1.04
time (sec)	N/A	0.135	0.419	0.356	0.599	0.815	0.000	0.000	1.483

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	187	234	232	0	0	0	125
normalized size	1	1.00	0.70	0.87	0.86	0.00	0.00	0.00	0.46
time (sec)	N/A	0.288	1.188	0.606	0.595	0.000	0.000	0.000	1.728

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	52	213	213	0	0	0	104
normalized size	1	1.00	0.21	0.87	0.87	0.00	0.00	0.00	0.42
time (sec)	N/A	0.235	0.386	0.613	0.601	0.000	0.000	0.000	0.948

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	175	204	211	0	0	0	104
normalized size	1	1.00	0.72	0.84	0.86	0.00	0.00	0.00	0.43
time (sec)	N/A	0.227	0.432	0.592	0.705	0.000	0.000	0.000	0.697

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	53	186	193	0	0	0	86
normalized size	1	1.00	0.24	0.84	0.87	0.00	0.00	0.00	0.39
time (sec)	N/A	0.200	0.257	0.535	0.787	0.000	0.000	0.000	0.445

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	236	195	202	0	0	0	86
normalized size	1	1.00	1.06	0.88	0.91	0.00	0.00	0.00	0.39
time (sec)	N/A	0.208	1.808	0.484	0.461	0.000	0.000	0.000	0.593

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	233	216	211	0	0	0	99
normalized size	1	1.00	0.94	0.87	0.85	0.00	0.00	0.00	0.40
time (sec)	N/A	0.237	1.262	0.467	0.540	0.000	0.000	0.000	0.701

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	249	249	141	216	221	0	0	0	99
normalized size	1	1.00	0.57	0.87	0.89	0.00	0.00	0.00	0.40
time (sec)	N/A	0.237	0.414	0.460	0.690	0.000	0.000	0.000	1.292

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	729	446	193	535	0	0	177
normalized size	1	1.00	3.92	2.40	1.04	2.88	0.00	0.00	0.95
time (sec)	N/A	0.300	6.104	0.791	0.500	0.951	0.000	0.000	2.440

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	332	419	175	487	0	0	143
normalized size	1	1.00	2.08	2.62	1.09	3.04	0.00	0.00	0.89
time (sec)	N/A	0.259	2.810	0.869	0.466	0.723	0.000	0.000	1.617

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	315	391	149	366	0	0	136
normalized size	1	1.00	2.28	2.83	1.08	2.65	0.00	0.00	0.99
time (sec)	N/A	0.203	1.553	0.960	0.760	0.718	0.000	0.000	0.990

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	292	379	136	349	0	0	100
normalized size	1	1.00	2.50	3.24	1.16	2.98	0.00	0.00	0.85
time (sec)	N/A	0.169	5.171	0.568	0.551	0.841	0.000	0.000	0.621

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	311	388	130	372	0	0	119
normalized size	1	1.00	2.73	3.40	1.14	3.26	0.00	0.00	1.04
time (sec)	N/A	0.175	2.894	0.479	0.680	0.665	0.000	0.000	0.576

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	417	388	133	378	0	0	101
normalized size	1	1.00	3.56	3.32	1.14	3.23	0.00	0.00	0.86
time (sec)	N/A	0.188	6.109	0.498	0.791	1.540	0.000	0.000	0.705

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	269	409	148	485	0	0	126
normalized size	1	1.00	1.91	2.90	1.05	3.44	0.00	0.00	0.89
time (sec)	N/A	0.229	3.345	0.526	0.773	0.454	0.000	0.000	1.261

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	174	430	170	514	0	0	129
normalized size	1	1.00	1.05	2.61	1.03	3.12	0.00	0.00	0.78
time (sec)	N/A	0.296	1.998	0.536	0.855	0.865	0.000	0.000	1.924

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	110	394	134	400	0	0	123
normalized size	1	1.00	0.99	3.55	1.21	3.60	0.00	0.00	1.11
time (sec)	N/A	0.451	0.884	0.730	1.567	0.899	0.000	0.000	0.682

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	107	368	118	333	0	0	79
normalized size	1	1.00	1.23	4.23	1.36	3.83	0.00	0.00	0.91
time (sec)	N/A	0.239	4.052	0.732	0.703	0.792	0.000	0.000	0.492

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	98	358	113	331	0	0	102
normalized size	1	1.00	1.13	4.11	1.30	3.80	0.00	0.00	1.17
time (sec)	N/A	0.218	0.251	0.812	0.809	0.841	0.000	0.000	0.368

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	107	365	120	321	0	0	79
normalized size	1	1.00	1.29	4.40	1.45	3.87	0.00	0.00	0.95
time (sec)	N/A	0.219	0.516	0.877	0.632	0.624	0.000	0.000	0.523

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	176	394	136	472	0	0	123
normalized size	1	1.00	1.59	3.55	1.23	4.25	0.00	0.00	1.11
time (sec)	N/A	0.452	2.034	0.810	1.645	1.134	0.000	0.000	0.644

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	131	416	154	500	0	0	132
normalized size	1	1.00	0.97	3.08	1.14	3.70	0.00	0.00	0.98
time (sec)	N/A	0.538	1.333	0.758	0.444	0.935	0.000	0.000	0.929

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	224	234	233	0	0	0	375
normalized size	1	1.00	0.80	0.83	0.83	0.00	0.00	0.00	1.33
time (sec)	N/A	0.544	2.019	0.829	0.438	0.000	0.000	0.000	0.898

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	312	234	232	0	0	0	376
normalized size	1	1.00	1.12	0.84	0.83	0.00	0.00	0.00	1.35
time (sec)	N/A	0.564	2.829	0.745	0.491	0.000	0.000	0.000	0.823

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	207	223	231	0	0	0	366
normalized size	1	1.00	0.74	0.80	0.83	0.00	0.00	0.00	1.32
time (sec)	N/A	0.531	1.299	0.792	0.585	0.000	0.000	0.000	0.722

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	337	222	238	0	0	0	366
normalized size	1	1.00	1.20	0.79	0.85	0.00	0.00	0.00	1.30
time (sec)	N/A	0.566	0.839	0.714	0.545	0.000	0.000	0.000	0.813

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	203	255	256	0	0	0	414
normalized size	1	1.00	0.66	0.83	0.84	0.00	0.00	0.00	1.35
time (sec)	N/A	0.796	1.327	0.654	0.870	0.000	0.000	0.000	0.923

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F(-2)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	331	331	467	276	274	0	0	0	425
normalized size	1	1.00	1.41	0.83	0.83	0.00	0.00	0.00	1.28
time (sec)	N/A	1.075	6.341	0.666	1.013	0.000	0.000	0.000	1.226

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	192	440	197	567	0	0	154
normalized size	1	1.00	1.17	2.68	1.20	3.46	0.00	0.00	0.94
time (sec)	N/A	0.617	2.134	0.831	0.456	0.465	0.000	0.000	1.037

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	131	434	189	533	0	0	178
normalized size	1	1.00	0.80	2.65	1.15	3.25	0.00	0.00	1.09
time (sec)	N/A	0.663	2.023	0.845	0.918	0.543	0.000	0.000	0.938

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	181	423	190	518	0	0	151
normalized size	1	1.00	1.12	2.63	1.18	3.22	0.00	0.00	0.94
time (sec)	N/A	0.592	0.818	0.856	0.601	0.534	0.000	0.000	0.898

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	217	426	189	504	0	0	173
normalized size	1	1.00	1.32	2.58	1.15	3.05	0.00	0.00	1.05
time (sec)	N/A	0.648	1.271	0.833	0.512	0.451	0.000	0.000	0.944

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	156	458	214	697	0	0	175
normalized size	1	1.00	0.83	2.42	1.13	3.69	0.00	0.00	0.93
time (sec)	N/A	0.863	1.211	0.795	0.713	0.662	0.000	0.000	1.141

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	167	482	224	718	0	0	193
normalized size	1	1.00	0.78	2.24	1.04	3.34	0.00	0.00	0.90
time (sec)	N/A	1.105	3.190	0.855	0.778	0.480	0.000	0.000	1.385

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	69	356	0	0	0	0	119
normalized size	1	1.00	0.31	1.60	0.00	0.00	0.00	0.00	0.53
time (sec)	N/A	0.266	0.166	0.269	0.000	0.000	0.000	0.000	0.631

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	61	249	0	0	0	0	210
normalized size	1	1.00	0.45	1.84	0.00	0.00	0.00	0.00	1.56
time (sec)	N/A	0.240	0.091	0.132	0.000	0.000	0.000	0.000	0.483

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	96	265	0	0	0	0	254
normalized size	1	1.00	0.69	1.91	0.00	0.00	0.00	0.00	1.83
time (sec)	N/A	0.235	0.318	0.175	0.000	0.000	0.000	0.000	0.996

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	98	452	0	0	0	0	254
normalized size	1	1.00	0.44	2.05	0.00	0.00	0.00	0.00	1.15
time (sec)	N/A	0.209	0.260	0.117	0.000	0.000	0.000	0.000	0.674

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	67	442	0	0	0	0	238
normalized size	1	1.00	0.31	2.07	0.00	0.00	0.00	0.00	1.11
time (sec)	N/A	0.185	0.168	0.224	0.000	0.000	0.000	0.000	0.438

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	51	249	0	0	0	0	230
normalized size	1	1.00	0.42	2.06	0.00	0.00	0.00	0.00	1.90
time (sec)	N/A	0.127	0.076	0.161	0.000	0.000	0.000	0.000	0.410

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	65	249	0	0	0	0	208
normalized size	1	1.00	0.47	1.79	0.00	0.00	0.00	0.00	1.50
time (sec)	N/A	0.193	0.132	0.186	0.000	0.000	0.000	0.000	0.501

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	71	356	0	0	0	0	121
normalized size	1	1.00	0.31	1.58	0.00	0.00	0.00	0.00	0.54
time (sec)	N/A	0.193	0.143	0.126	0.000	0.000	0.000	0.000	0.400

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	75	265	0	0	0	0	242
normalized size	1	1.00	0.52	1.85	0.00	0.00	0.00	0.00	1.69
time (sec)	N/A	0.205	0.406	0.193	0.000	0.000	0.000	0.000	0.800

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	69	444	0	0	0	0	238
normalized size	1	1.00	0.32	2.06	0.00	0.00	0.00	0.00	1.10
time (sec)	N/A	0.176	0.242	0.134	0.000	0.000	0.000	0.000	0.709

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	68	363	221	0	0	0	153
normalized size	1	1.00	0.28	1.47	0.89	0.00	0.00	0.00	0.62
time (sec)	N/A	0.207	0.131	0.367	0.852	0.000	0.000	0.000	1.397

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	155	337	199	0	0	0	128
normalized size	1	1.00	0.69	1.49	0.88	0.00	0.00	0.00	0.57
time (sec)	N/A	0.172	0.282	0.355	0.728	0.000	0.000	0.000	0.726

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	166	327	180	0	0	0	118
normalized size	1	1.00	0.80	1.57	0.87	0.00	0.00	0.00	0.57
time (sec)	N/A	0.142	0.216	0.406	0.750	0.000	0.000	0.000	0.647

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	196	355	204	0	0	0	137
normalized size	1	1.00	0.86	1.55	0.89	0.00	0.00	0.00	0.60
time (sec)	N/A	0.194	0.359	0.372	0.692	0.000	0.000	0.000	0.805

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	196	374	220	0	0	0	158
normalized size	1	1.00	0.78	1.48	0.87	0.00	0.00	0.00	0.63
time (sec)	N/A	0.258	0.758	0.482	0.704	0.000	0.000	0.000	1.245

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	224	581	287	0	0	0	1274
normalized size	1	1.00	0.71	1.83	0.91	0.00	0.00	0.00	4.02
time (sec)	N/A	0.334	1.982	0.650	0.585	0.000	0.000	0.000	2.471

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	288	288	220	534	257	0	0	0	1157
normalized size	1	1.00	0.76	1.85	0.89	0.00	0.00	0.00	4.02
time (sec)	N/A	0.275	0.569	0.539	0.451	0.000	0.000	0.000	1.212

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	192	529	242	0	0	0	1234
normalized size	1	1.00	0.72	1.98	0.91	0.00	0.00	0.00	4.62
time (sec)	N/A	0.249	0.890	0.520	0.797	0.000	0.000	0.000	1.013

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	218	538	242	0	0	0	1196
normalized size	1	1.00	0.82	2.01	0.91	0.00	0.00	0.00	4.48
time (sec)	N/A	0.258	0.330	0.456	0.900	0.000	0.000	0.000	0.936

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	82	558	259	0	0	0	1214
normalized size	1	1.00	0.28	1.92	0.89	0.00	0.00	0.00	4.17
time (sec)	N/A	0.334	0.301	0.466	0.626	0.000	0.000	0.000	1.512

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	85	600	286	0	0	0	1227
normalized size	1	1.00	0.26	1.86	0.89	0.00	0.00	0.00	3.81
time (sec)	N/A	0.428	0.358	0.449	0.530	0.000	0.000	0.000	2.320

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	372	372	251	807	347	0	0	0	2317
normalized size	1	1.00	0.67	2.17	0.93	0.00	0.00	0.00	6.23
time (sec)	N/A	0.564	3.061	0.753	0.440	0.000	0.000	0.000	5.474

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	342	342	247	750	316	0	0	0	2071
normalized size	1	1.00	0.72	2.19	0.92	0.00	0.00	0.00	6.06
time (sec)	N/A	0.477	2.593	0.722	0.437	0.000	0.000	0.000	2.546

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	313	313	216	725	292	0	0	0	1896
normalized size	1	1.00	0.69	2.32	0.93	0.00	0.00	0.00	6.06
time (sec)	N/A	0.425	1.034	0.607	0.517	0.000	0.000	0.000	1.413

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	313	313	193	742	290	0	0	0	1951
normalized size	1	1.00	0.62	2.37	0.93	0.00	0.00	0.00	6.23
time (sec)	N/A	0.420	3.390	0.467	0.653	0.000	0.000	0.000	1.204

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	313	313	104	743	289	0	0	0	1946
normalized size	1	1.00	0.33	2.37	0.92	0.00	0.00	0.00	6.22
time (sec)	N/A	0.458	0.376	0.459	0.693	0.000	0.000	0.000	1.671

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	343	343	108	786	316	0	0	0	1969
normalized size	1	1.00	0.31	2.29	0.92	0.00	0.00	0.00	5.74
time (sec)	N/A	0.561	0.612	0.463	0.711	0.000	0.000	0.000	3.063

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	377	377	116	829	342	0	0	0	1992
normalized size	1	1.00	0.31	2.20	0.91	0.00	0.00	0.00	5.28
time (sec)	N/A	0.662	0.677	0.451	0.766	0.000	0.000	0.000	5.257

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	325	325	286	459	259	0	0	0	5579
normalized size	1	1.00	0.88	1.41	0.80	0.00	0.00	0.00	17.17
time (sec)	N/A	0.660	0.874	0.673	0.538	0.000	0.000	0.000	1.973

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	302	302	249	429	236	0	0	0	5129
normalized size	1	1.00	0.82	1.42	0.78	0.00	0.00	0.00	16.98
time (sec)	N/A	0.379	0.567	0.687	0.494	0.000	0.000	0.000	1.627

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	302	302	226	417	233	0	0	0	4808
normalized size	1	1.00	0.75	1.38	0.77	0.00	0.00	0.00	15.92
time (sec)	N/A	0.376	0.283	0.790	0.484	0.000	0.000	0.000	1.386

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	302	302	248	423	239	0	0	0	4871
normalized size	1	1.00	0.82	1.40	0.79	0.00	0.00	0.00	16.13
time (sec)	N/A	0.370	0.254	0.712	0.526	0.000	0.000	0.000	1.768

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	325	325	198	459	261	0	0	0	4899
normalized size	1	1.00	0.61	1.41	0.80	0.00	0.00	0.00	15.07
time (sec)	N/A	0.660	0.446	0.614	0.910	0.000	0.000	0.000	1.860

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	351	351	109	481	280	0	0	0	6042
normalized size	1	1.00	0.31	1.37	0.80	0.00	0.00	0.00	17.21
time (sec)	N/A	0.962	0.283	0.629	0.662	0.000	0.000	0.000	2.807

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	437	437	445	805	385	0	0	0	13244
normalized size	1	1.00	1.02	1.84	0.88	0.00	0.00	0.00	30.31
time (sec)	N/A	1.108	6.158	0.831	0.462	0.000	0.000	0.000	3.970

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	393	393	390	784	359	0	0	0	12617
normalized size	1	1.00	0.99	1.99	0.91	0.00	0.00	0.00	32.10
time (sec)	N/A	0.740	2.795	0.781	0.449	0.000	0.000	0.000	3.121

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	387	387	322	768	344	0	0	0	11953
normalized size	1	1.00	0.83	1.98	0.89	0.00	0.00	0.00	30.89
time (sec)	N/A	0.677	3.326	0.757	0.592	0.000	0.000	0.000	3.366

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	386	386	401	749	343	0	0	0	11731
normalized size	1	1.00	1.04	1.94	0.89	0.00	0.00	0.00	30.39
time (sec)	N/A	0.646	6.099	0.823	0.668	0.000	0.000	0.000	3.084

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	394	394	300	765	360	0	0	0	9400
normalized size	1	1.00	0.76	1.94	0.91	0.00	0.00	0.00	23.86
time (sec)	N/A	0.738	2.865	0.846	0.535	0.000	0.000	0.000	8.163

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	437	437	244	803	402	0	0	0	15251
normalized size	1	1.00	0.56	1.84	0.92	0.00	0.00	0.00	34.90
time (sec)	N/A	1.095	0.630	0.763	0.718	0.000	0.000	0.000	4.335

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F(-1)	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	529	529	556	1254	537	0	0	0	20651
normalized size	1	1.00	1.05	2.37	1.02	0.00	0.00	0.00	39.04
time (sec)	N/A	1.631	6.261	0.853	0.615	0.000	0.000	0.000	10.399

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	476	476	525	1232	516	0	0	0	20089
normalized size	1	1.00	1.10	2.59	1.08	0.00	0.00	0.00	42.20
time (sec)	N/A	1.230	6.189	0.880	0.755	0.000	0.000	0.000	7.262

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	470	470	488	1229	505	0	0	0	19256
normalized size	1	1.00	1.04	2.61	1.07	0.00	0.00	0.00	40.97
time (sec)	N/A	1.295	6.199	0.995	0.558	0.000	0.000	0.000	6.515

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	461	461	518	1212	492	0	0	0	19000
normalized size	1	1.00	1.12	2.63	1.07	0.00	0.00	0.00	41.21
time (sec)	N/A	1.234	6.156	0.870	0.778	0.000	0.000	0.000	6.213

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	463	463	483	1187	496	0	0	0	19534
normalized size	1	1.00	1.04	2.56	1.07	0.00	0.00	0.00	42.19
time (sec)	N/A	1.147	6.186	0.972	0.842	0.000	0.000	0.000	6.127

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	476	476	411	1190	510	0	0	0	20155
normalized size	1	1.00	0.86	2.50	1.07	0.00	0.00	0.00	42.34
time (sec)	N/A	1.242	6.134	0.845	0.475	0.000	0.000	0.000	6.789

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	529	529	303	1245	565	0	0	0	21158
normalized size	1	1.00	0.57	2.35	1.07	0.00	0.00	0.00	40.00
time (sec)	N/A	1.658	1.792	0.795	0.453	0.000	0.000	0.000	9.999

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	167	167	118	0	0	0	0	0	-1
normalized size	1	1.00	0.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.243	0.302	1.235	0.000	1.000	0.000	0.000	0.000

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.272	3.252	2.421	0.000	1.218	0.000	0.000	0.000

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	1622	0	159	0	0	1410
normalized size	1	1.00	1.00	36.04	0.00	3.53	0.00	0.00	31.33
time (sec)	N/A	0.065	0.081	0.457	0.000	0.710	0.000	0.000	2.536

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	70	1622	0	159	0	0	1410
normalized size	1	1.00	1.56	36.04	0.00	3.53	0.00	0.00	31.33
time (sec)	N/A	0.059	1.721	0.538	0.000	0.590	0.000	0.000	1.403

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	67	187	89	79	534	95	155
normalized size	1	1.00	1.14	3.17	1.51	1.34	9.05	1.61	2.63
time (sec)	N/A	0.078	0.130	0.419	1.690	0.546	1.109	0.534	0.995

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	144	356	185	340	3966	241	268
normalized size	1	1.00	1.30	3.21	1.67	3.06	35.73	2.17	2.41
time (sec)	N/A	0.149	1.929	0.370	0.530	0.559	4.232	0.490	1.460

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	202	559	337	549	0	412	481
normalized size	1	1.00	1.15	3.19	1.93	3.14	0.00	2.35	2.75
time (sec)	N/A	0.276	5.003	0.382	0.866	0.708	0.000	0.489	2.602

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	379	2405	0	0	0	0	3864
normalized size	1	1.00	2.02	12.79	0.00	0.00	0.00	0.00	20.55
time (sec)	N/A	0.453	1.795	0.547	0.000	0.000	0.000	0.000	31.594

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	294	1665	0	0	0	0	2823
normalized size	1	1.00	1.96	11.10	0.00	0.00	0.00	0.00	18.82
time (sec)	N/A	0.333	0.974	0.539	0.000	0.000	0.000	0.000	13.758

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	212	968	0	0	0	0	843
normalized size	1	1.00	1.74	7.93	0.00	0.00	0.00	0.00	6.91
time (sec)	N/A	0.262	0.567	0.531	0.000	0.000	0.000	0.000	3.029

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	253	1375	0	0	0	0	3442
normalized size	1	1.00	1.68	9.11	0.00	0.00	0.00	0.00	22.79
time (sec)	N/A	0.278	3.959	0.555	0.000	0.000	0.000	0.000	26.556

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	408	408	178	972	0	0	0	0	2529
normalized size	1	1.00	0.44	2.38	0.00	0.00	0.00	0.00	6.20
time (sec)	N/A	0.511	1.938	0.510	0.000	0.000	0.000	0.000	11.956

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	422	422	158	2285	0	0	0	0	583
normalized size	1	1.00	0.37	5.41	0.00	0.00	0.00	0.00	1.38
time (sec)	N/A	0.418	1.055	0.540	0.000	0.000	0.000	0.000	2.571

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	154	3976	0	0	0	0	2909
normalized size	1	1.00	1.51	38.98	0.00	0.00	0.00	0.00	28.52
time (sec)	N/A	0.160	0.611	0.490	0.000	0.000	0.000	0.000	2.290

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	226	7951	0	0	0	0	5737
normalized size	1	1.00	1.64	57.62	0.00	0.00	0.00	0.00	41.57
time (sec)	N/A	0.263	1.674	0.459	0.000	0.000	0.000	0.000	6.466

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	319	12836	0	0	0	0	9453
normalized size	1	1.00	1.72	69.38	0.00	0.00	0.00	0.00	51.10
time (sec)	N/A	0.402	3.530	0.440	0.000	0.000	0.000	0.000	17.933

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	146	1905	0	0	0	0	2731
normalized size	1	1.00	1.43	18.68	0.00	0.00	0.00	0.00	26.77
time (sec)	N/A	0.162	0.331	0.543	0.000	0.000	0.000	0.000	2.202

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	216	2291	0	0	0	0	5475
normalized size	1	1.00	1.64	17.36	0.00	0.00	0.00	0.00	41.48
time (sec)	N/A	0.248	1.473	0.563	0.000	0.000	0.000	0.000	5.961

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	232	3055	0	0	0	0	8438
normalized size	1	1.00	1.33	17.56	0.00	0.00	0.00	0.00	48.49
time (sec)	N/A	0.382	5.938	0.556	0.000	0.000	0.000	0.000	16.173

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 [48] had the largest ratio of [.9091]

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	2	2	1.00	15	0.133
2	A	5	3	1.00	23	0.130
3	A	4	3	1.00	23	0.130
4	A	3	3	1.00	23	0.130
5	A	2	2	1.00	23	0.087
6	A	3	3	1.00	23	0.130
7	A	4	3	1.00	23	0.130
8	A	16	12	1.00	25	0.480
9	A	15	12	1.00	25	0.480
10	A	15	12	1.00	25	0.480
11	A	14	11	1.00	25	0.440
12	A	13	10	1.00	25	0.400
13	A	14	11	1.00	25	0.440
14	A	14	11	1.00	25	0.440
15	A	7	5	1.00	25	0.200
16	A	6	5	1.00	25	0.200
17	A	5	5	1.00	25	0.200
18	A	4	4	1.00	25	0.160
19	A	4	4	1.00	25	0.160
20	A	4	4	1.00	25	0.160
21	A	5	5	1.00	25	0.200
22	A	6	5	1.00	25	0.200
23	A	7	6	1.00	25	0.240
24	A	6	6	1.00	25	0.240
25	A	6	5	1.00	25	0.200

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	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
26	A	6	6	1.00	25	0.240
27	A	7	6	1.00	25	0.240
28	A	10	10	1.00	25	0.400
29	A	17	14	1.00	25	0.560
30	A	18	15	1.00	25	0.600
31	A	17	14	1.00	25	0.560
32	A	18	15	1.00	25	0.600
33	A	18	15	1.00	25	0.600
34	A	20	16	1.00	25	0.640
35	A	8	8	1.00	25	0.320
36	A	8	7	1.00	25	0.280
37	A	8	8	1.00	25	0.320
38	A	8	7	1.00	25	0.280
39	A	9	8	1.00	25	0.320
40	A	10	8	1.00	25	0.320
41	A	12	9	1.00	13	0.692
42	A	6	5	1.00	11	0.454
43	A	8	7	1.00	13	0.538
44	A	14	9	1.00	11	0.818
45	A	12	8	1.00	13	0.615
46	A	5	4	1.00	11	0.364
47	A	6	5	1.00	13	0.385
48	A	13	10	1.00	11	0.909
49	A	8	7	1.00	13	0.538
50	A	13	9	1.00	11	0.818
51	A	12	8	1.00	23	0.348

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
52	A	11	8	1.00	23	0.348
53	A	10	7	1.00	23	0.304
54	A	11	8	1.00	23	0.348
55	A	12	8	1.00	23	0.348
56	A	13	9	1.00	25	0.360
57	A	12	9	1.00	25	0.360
58	A	11	8	1.00	25	0.320
59	A	11	8	1.00	25	0.320
60	A	12	9	1.00	25	0.360
61	A	13	9	1.00	25	0.360
62	A	14	10	1.00	25	0.400
63	A	13	10	1.00	25	0.400
64	A	12	9	1.00	25	0.360
65	A	12	9	1.00	25	0.360
66	A	12	9	1.00	25	0.360
67	A	13	10	1.00	25	0.400
68	A	14	10	1.00	25	0.400
69	A	15	12	1.00	25	0.480
70	A	14	11	1.00	25	0.440
71	A	14	11	1.00	25	0.440
72	A	14	11	1.00	25	0.440
73	A	15	12	1.00	25	0.480
74	A	16	13	1.00	25	0.520
75	A	16	13	1.00	25	0.520
76	A	15	12	1.00	25	0.480
77	A	15	12	1.00	25	0.480

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
78	A	15	12	1.00	25	0.480
79	A	15	12	1.00	25	0.480
80	A	16	13	1.00	25	0.520
81	A	17	14	1.00	25	0.560
82	A	16	13	1.00	25	0.520
83	A	16	13	1.00	25	0.520
84	A	16	13	1.00	25	0.520
85	A	16	13	1.00	25	0.520
86	A	16	13	1.00	25	0.520
87	A	17	13	1.00	25	0.520
88	A	5	3	1.00	12	0.250
89	A	8	5	1.00	23	0.217
90	A	3	3	1.00	27	0.111
91	A	3	3	1.00	27	0.111
92	A	2	2	1.00	23	0.087
93	A	3	3	1.00	23	0.130
94	A	4	3	1.00	23	0.130
95	A	10	5	1.00	25	0.200
96	A	9	5	1.00	25	0.200
97	A	8	5	1.00	25	0.200
98	A	10	7	1.00	27	0.259
99	A	13	9	1.00	27	0.333
100	A	13	9	1.00	27	0.333
101	A	7	4	1.00	25	0.160
102	A	8	5	1.00	25	0.200
103	A	9	5	1.00	25	0.200

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
104	A	7	4	1.00	27	0.148
105	A	8	5	1.00	27	0.185
106	A	9	5	1.00	27	0.185

Chapter 3

Listing of integrals

3.1 $\int (a + ia\cot(c + dx))^n\, dx$

Optimal. Leaf size=49

$$\frac{i(a + ia\cot(c + dx))^n\,{}_2F_1\left(1, n; n + 1; \frac{1}{2}(i\cot(c + dx) + 1)\right)}{2dn}$$

```
[Out] 1/2*I*(a+I*a*cot(d*x+c))^n*hypergeom([1, n],[1+n],1/2+1/2*I*cot(d*x+c))/d/n
```

Rubi [A] time = 0.03, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3481, 68}

$$\frac{i(a + ia\cot(c + dx))^n\,{}_2F_1\left(1, n; n + 1; \frac{1}{2}(i\cot(c + dx) + 1)\right)}{2dn}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Cot[c + d*x])^n,x]
```

```
[Out] ((I/2)*(a + I*a*Cot[c + d*x])^n*Hypergeometric2F1[1, n, 1 + n, (1 + I*Cot[c
 + d*x])/2])/(d*n)
```

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]
```

Rule 3481

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Dist[b/d, Su
bst[Int[(a + x)^(n - 1)/(a - x), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b,
 c, d, n}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (a+ia\cot(c+dx))^n\,dx = \frac{(ia)\,\text{Subst}\left(\int \frac{(a+x)^{-1+n}}{a-x}\,dx, x, ia\cot(c+dx)\right)}{d}$$
$$= \frac{i(a+ia\cot(c+dx))^n\,{}_2F_1\left(1,n;1+n;\frac{1}{2}(1+i\cot(c+dx))\right)}{2dn}$$

Mathematica [B] time = 0.32, size = 117, normalized size = 2.39

$$\frac{i(a+ia\cot(c+dx))^n\left(2(n+1)\,{}_2F_1(1,n;n+1;i\cot(c+dx)+1)+(n+in\cot(c+dx))\left({}_2F_1\left(1,n+1;n+2;\frac{1}{2}(i\,\text{cc}\right.\right.\right.}{4dn(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Cot[c + d*x])^n,x]
```

```
[Out] ((I/4)*(a + I*a*Cot[c + d*x])^n*(2*(1 + n)*Hypergeometric2F1[1, n, 1 + n, 1
 + I*Cot[c + d*x]] + (n + I*n*Cot[c + d*x])*(Hypergeometric2F1[1, 1 + n, 2
+ n, (1 + I*Cot[c + d*x])/2] - 2*Hypergeometric2F1[1, 1 + n, 2 + n, 1 + I*C
ot[c + d*x]])))/(d*n*(1 + n))
```

fricas [F] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(-\frac{2\,a}{e^{(2i\,dx+2i\,c)}-1}\right)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*cot(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((-2*a/(e^(2*I*d*x + 2*I*c) - 1))^n, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\cot(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*cot(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*cot(d*x + c) + a)^n, x)
```

maple [F] time = 2.50, size = 0, normalized size = 0.00

$$\int (a + ia\cot(dx + c))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*cot(d*x+c))^n,x)
```

```
[Out] int((a+I*a*cot(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\, a\cot(dx + c) + a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*cot(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*cot(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int (a + a\cot(c + d\,x)\ 1\mathrm{i})^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x)*1i)^n,x)
```

```
[Out] int((a + a*cot(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia\cot(c + dx) + a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*cot(d*x+c))**n,x)
```

```
[Out] Integral((I*a*cot(c + d*x) + a)**n, x)
```

3.2 $\int (e\cot(c+dx))^{5/2}(a+a\cot(c+dx))\,dx$

Optimal. Leaf size=116

$$-\frac{\sqrt{2}\,ae^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d}+\frac{2ae^2\sqrt{e\cot(c+dx)}}{d}-\frac{2ae(e\cot(c+dx))^{3/2}}{3d}-\frac{2a(e\cot(c+dx))^{5/2}}{5d}$$

```
[Out] -2/3*a*e*(e*cot(d*x+c))^(3/2)/d-2/5*a*(e*cot(d*x+c))^(5/2)/d-a*e^(5/2)*arct
anh(1/2*(e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*2^(1/2)/
d+2*a*e^2*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.16, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3528, 3532, 208}

$$\frac{2ae^2\sqrt{e\cot(c+dx)}}{d}-\frac{\sqrt{2}\,ae^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{2ae(e\cot(c+dx))^{3/2}}{3d}-\frac{2a(e\cot(c+dx))^{5/2}}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x]),x]
```

```
[Out] -((Sqrt[2]*a*e^(5/2)*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt
[e*Cot[c + d*x]])])/d) + (2*a*e^2*Sqrt[e*Cot[c + d*x]])/d - (2*a*e*(e*Cot[c
 + d*x])^(3/2))/(3*d) - (2*a*(e*Cot[c + d*x])^(5/2))/(5*d)
```

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 3528

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

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
```

```
EqQ[c^2 - d^2, 0]
```

Rubi steps

$$\int (e\cot(c+dx))^{5/2}(a+a\cot(c+dx))\,dx = -\frac{2a(e\cot(c+dx))^{5/2}}{5d} + \int (e\cot(c+dx))^{3/2}(-ae+ae\cot(c+dx))\,dx$$
$$= -\frac{2ae(e\cot(c+dx))^{3/2}}{3d} - \frac{2a(e\cot(c+dx))^{5/2}}{5d} + \int \sqrt{e\cot(c+dx)}\,(-$$
$$= \frac{2ae^2\sqrt{e\cot(c+dx)}}{d} - \frac{2ae(e\cot(c+dx))^{3/2}}{3d} - \frac{2a(e\cot(c+dx))^{5/2}}{5d} +$$
$$= \frac{2ae^2\sqrt{e\cot(c+dx)}}{d} - \frac{2ae(e\cot(c+dx))^{3/2}}{3d} - \frac{2a(e\cot(c+dx))^{5/2}}{5d} -$$
$$= -\frac{\sqrt{2}\,ae^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d} + \frac{2ae^2\sqrt{e\cot(c+dx)}}{d} - \frac{2ae(e\,\mathrm{co}}{}$$

Mathematica [C] time = 0.19, size = 68, normalized size = 0.59

$$-\frac{2ae(e\cot(c+dx))^{3/2}\left(5\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\tan^2(c+dx)\right)+3\cot(c+dx)\,{}_2F_1\left(-\frac{5}{4},1;-\frac{1}{4};-\tan^2(c+dx)\right)\right)}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x]),x]
```

```
[Out] (-2*a*e*(e*Cot[c + d*x])^(3/2)*(3*Cot[c + d*x]*Hypergeometric2F1[-5/4, 1, -
1/4, -Tan[c + d*x]^2] + 5*Hypergeometric2F1[-3/4, 1, 1/4, -Tan[c + d*x]^2])
)/(15*d)
```

fricas [A] time = 0.90, size = 377, normalized size = 3.25

$$\left[\frac{15\sqrt{2}\left(ae^2\cos(2dx+2c)-ae^2\right)\sqrt{e}\,\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e\cos(2dx+2c)+e}{\sin(2dx+2c)}}\left(\cos(2dx+2c)-\sin(2dx+2c)-1\right)+2e\,\mathrm{si}\right.}{30\left(d\cos(2dx+2c)\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/30*(15*sqrt(2)*(a*e^2*cos(2*d*x + 2*c) - a*e^2)*sqrt(e)*log(sqrt(2)*sqrt
(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin
(2*d*x + 2*c) - 1) + 2*e*sin(2*d*x + 2*c) + e) + 4*(18*a*e^2*cos(2*d*x + 2*
c) + 5*a*e^2*sin(2*d*x + 2*c) - 12*a*e^2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin
(2*d*x + 2*c)))/(d*cos(2*d*x + 2*c) - d), 1/15*(15*sqrt(2)*(a*e^2*cos(2*d*x
 + 2*c) - a*e^2)*sqrt(-e)*arctan(1/2*sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2
*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)/(e*cos
(2*d*x + 2*c) + e)) + 2*(18*a*e^2*cos(2*d*x + 2*c) + 5*a*e^2*sin(2*d*x + 2*
c) - 12*a*e^2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*cos(2*d*
x + 2*c) - d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)\,(e\cot(dx+c))^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)*(e*cot(d*x + c))^(5/2), x)
```

maple [B] time = 0.50, size = 388, normalized size = 3.34

$$-\frac{2a\,(e\cot(dx+c))^{\frac{5}{2}}}{5d}-\frac{2ae\,(e\cot(dx+c))^{\frac{3}{2}}}{3d}+\frac{2a\,e^{2}\sqrt{e\cot(dx+c)}}{d}-\frac{a\,e^{2}\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)*(a+cot(d*x+c)*a),x)
```

```
[Out] -2/5*a*(e*cot(d*x+c))^(5/2)/d-2/3*a*e*(e*cot(d*x+c))^(3/2)/d+2*a*e^2*(e*cot
(d*x+c))^(1/2)/d-1/4*a/d*e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/2*a/d*e^2*(e^2)^(1/4)*2^(1/2)*arct
an(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2*a/d*e^2*(e^2)^(1/4)*2^(1
/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4*a/d*e^3*2^(1/2)
/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2
)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
))+1/2*a/d*e^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)+1)-1/2*a/d*e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.76, size = 149, normalized size = 1.28

$$-\frac{\left(15\,ae^2\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)-\frac{4\left(15\,ae^2\sqrt{\frac{e}{\tan(dx+c)}}-5\,ae\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}-3\right.}{e}}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/30*(15*a*e^2*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/t
an(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) +
e + e/tan(d*x + c))/sqrt(e)) - 4*(15*a*e^2*sqrt(e/tan(d*x + c)) - 5*a*e*(e/
tan(d*x + c))^(3/2) - 3*a*(e/tan(d*x + c))^(5/2))/e)*e/d
```

mupad [B] time = 1.98, size = 144, normalized size = 1.24

$$\frac{2\,a\,e^2\,\sqrt{e\cot\left(c+d\,x\right)}}{d}-\frac{2\,a\,e\,{\left(e\cot\left(c+d\,x\right)\right)}^{3/2}}{3\,d}-\frac{2\,a\,{\left(e\cot\left(c+d\,x\right)\right)}^{5/2}}{5\,d}+\frac{{\left(-1\right)}^{1/4}\,a\,e^{5/2}\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot(c+d\,x)}\,1\mathrm{i}}{\sqrt{e}}\right)}{d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)*(a + a*cot(c + d*x)),x)
```

```
[Out] (2*a*e^2*(e*cot(c + d*x))^(1/2))/d - (2*a*e*(e*cot(c + d*x))^(3/2))/(3*d) -
 (2*a*(e*cot(c + d*x))^(5/2))/(5*d) + ((-1)^(1/4)*a*e^(5/2)*atan(((-1)^(1/4
)*(e*cot(c + d*x))^(1/2))/e^(1/2))*(1 + 1i))/d + ((-1)^(1/4)*a*e^(5/2)*atan
(((-1)^(1/4)*(e*cot(c + d*x))^(1/2)*1i)/e^(1/2)))/d - ((-1)^(1/4)*a*e^(5/2)
*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\int(e\cot(c+dx))^{\frac{5}{2}}\,dx+\int(e\cot(c+dx))^{\frac{5}{2}}\cot(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)*(a+a*cot(d*x+c)),x)
```

```
[Out] a*(Integral((e*cot(c + d*x))**(5/2), x) + Integral((e*cot(c + d*x))**(5/2)*
cot(c + d*x), x))
```

3.3 $\int (e\cot(c+dx))^{3/2}(a+a\cot(c+dx))\,dx$

Optimal. Leaf size=94

$$-\frac{\sqrt{2}\,ae^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{2ae\sqrt{e\cot(c+dx)}}{d}-\frac{2a(e\cot(c+dx))^{3/2}}{3d}$$

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

Rubi [A] time = 0.12, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3528, 3532, 205}

$$-\frac{\sqrt{2}\,ae^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{2ae\sqrt{e\cot(c+dx)}}{d}-\frac{2a(e\cot(c+dx))^{3/2}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x]),x]
```

```
[Out] -((Sqrt[2]*a*e^(3/2)*ArcTan[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[
e*Cot[c + d*x]])])/d) - (2*a*e*Sqrt[e*Cot[c + d*x]])/d - (2*a*(e*Cot[c + d*
x])^(3/2))/(3*d)
```

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 3528

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

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rubi steps

$$\int (e\cot(c+dx))^{3/2}(a+a\cot(c+dx))\,dx = -\frac{2a(e\cot(c+dx))^{3/2}}{3d} + \int \sqrt{e\cot(c+dx)}\,(-ae+ae\cot(c+dx))\,dx$$

$$= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2a(e\cot(c+dx))^{3/2}}{3d} + \int \frac{-ae^2-ae^2\cot(c+ }{\sqrt{e\cot(c+dx)}}$$

$$= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2a(e\cot(c+dx))^{3/2}}{3d} - \frac{(2a^2e^4)\,\mathrm{Subst}\left(\int \frac{1}{-2a^2e}\right.}{}$$

$$= -\frac{\sqrt{2}\,ae^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d} - \frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2a(e\cot(c}{3d}$$

Mathematica [C] time = 0.11, size = 67, normalized size = 0.71

$$-\frac{2ae\sqrt{e\cot(c+dx)}\left(3\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\tan^2(c+dx)\right)+\cot(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\tan^2(c+dx)\right)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x]),x]
```

```
[Out] (-2*a*e*Sqrt[e*Cot[c + d*x]]*(Cot[c + d*x]*Hypergeometric2F1[-3/4, 1, 1/4,
-Tan[c + d*x]^2] + 3*Hypergeometric2F1[-1/4, 1, 3/4, -Tan[c + d*x]^2]))/(3*
d)
```

fricas [B] time = 0.75, size = 334, normalized size = 3.55

$$\left[\frac{3\sqrt{2}\,a\sqrt{-e}\,e\log\left(\sqrt{2}\sqrt{-e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos(2\,dx+2\,c)+\sin(2\,dx+2\,c)-1)-2\,e\sin(2\,dx+2\,c)+e\right)\sin}{6\,d\sin(2\,dx+2\,c)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/6*(3*sqrt(2)*a*sqrt(-e)*e*log(sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c)
+ e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) - 1) - 2*e*sin(
2*d*x + 2*c) + e)*sin(2*d*x + 2*c) - 4*(a*e*cos(2*d*x + 2*c) + 3*a*e*sin(2*
```

```
d*x + 2*c) + a*e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*sin(2
*d*x + 2*c)), -1/3*(3*sqrt(2)*a*e^(3/2)*arctan(-1/2*sqrt(2)*sqrt(e)*sqrt((e
*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*
c) + 1)/(e*cos(2*d*x + 2*c) + e))*sin(2*d*x + 2*c) + 2*(a*e*cos(2*d*x + 2*c
) + 3*a*e*sin(2*d*x + 2*c) + a*e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x +
 2*c)))/(d*sin(2*d*x + 2*c))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)\,(e\cot(dx+c))^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)*(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.43, size = 363, normalized size = 3.86

$$-\frac{2a\,(e\cot(dx+c))^{\frac{3}{2}}}{3d}-\frac{2ae\sqrt{e\cot(dx+c)}}{d}+\frac{ae\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d}+\frac{ae\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\text{arcta}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)*(a+cot(d*x+c)*a),x)
```

```
[Out] -2/3*a*(e*cot(d*x+c))^(3/2)/d-2*a*e*(e*cot(d*x+c))^(1/2)/d+1/4*a/d*e*(e^2)^
(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
)))+1/2*a/d*e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)+1)-1/2*a/d*e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)+1)+1/4*a/d*e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2*a/d*e^2*2^(1/2)/(e^2)^(1/4)*arct
an(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2*a/d*e^2*2^(1/2)/(e^2)^(1
/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.62, size = 124, normalized size = 1.32

$$\frac{\left(3\,ae\left(\frac{\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}\right)-\frac{2\left(3\,ae\sqrt{\frac{e}{\tan(dx+c)}}+a\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}\right)}{e}\right)e}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/3*(3*a*e*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x
+ c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*
sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e)) - 2*(3*a*e*sqrt(e/tan(d*x + c)) + a
*(e/tan(d*x + c))^(3/2))/e)*e/d
```

mupad [B] time = 1.16, size = 98, normalized size = 1.04

$$-\frac{2\,a\,{\left(e\,\mathrm{cot}\left(c+d\,x\right)\right)}^{3/2}}{3\,d}-\frac{2\,a\,e\,\sqrt{e\,\mathrm{cot}\left(c+d\,x\right)}}{d}+\frac{{\left(-1\right)}^{1/4}\,a\,e^{3/2}\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\,\mathrm{cot}\left(c+d\,x\right)}}{\sqrt{e}}\right)\,\left(1-\mathrm{i}\right)}{d}+\frac{{\left(-1\right)}^{1/4}\,a\,e^{3/2}\,\mathrm{atanh}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)*(a + a*cot(c + d*x)),x)
```

```
[Out] ((-1)^(1/4)*a*e^(3/2)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*(1
- 1i))/d - (2*a*e*(e*cot(c + d*x))^(1/2))/d - (2*a*(e*cot(c + d*x))^(3/2))/
(3*d) - ((-1)^(1/4)*a*e^(3/2)*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(
1/2))*(1 + 1i))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\int \left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\,dx+\int \left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\cot\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)*(a+a*cot(d*x+c)),x)
```

```
[Out] a*(Integral((e*cot(c + d*x))**(3/2), x) + Integral((e*cot(c + d*x))**(3/2)*
cot(c + d*x), x))
```

3.4 $\int \sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))\,dx$

Optimal. Leaf size=71

$$\frac{\sqrt{2}\,a\sqrt{e}\,\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{2a\sqrt{e\cot(c+dx)}}{d}$$

```
[Out] a*arctanh(1/2*(e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*2^
(1/2)*e^(1/2)/d-2*a*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.08, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3528, 3532, 208}

$$\frac{\sqrt{2}\,a\sqrt{e}\,\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{2a\sqrt{e\cot(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x]),x]
```

```
[Out] (Sqrt[2]*a*Sqrt[e]*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e
*Cot[c + d*x]])])/d - (2*a*Sqrt[e*Cot[c + d*x]])/d
```

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 3528

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

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rubi steps

$$\int \sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))\,dx = -\frac{2a\sqrt{e\cot(c+dx)}}{d} + \int \frac{-ae+ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$$
$$= -\frac{2a\sqrt{e\cot(c+dx)}}{d} - \frac{(2a^2e^2)\,\text{Subst}\left(\int \frac{1}{2a^2e^2-ex^2}\,dx, x, \frac{-ae-ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\right)}{d}$$
$$= \frac{\sqrt{2}\,a\sqrt{e}\,\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d} - \frac{2a\sqrt{e\cot(c+dx)}}{d}$$

Mathematica [C] time = 0.29, size = 154, normalized size = 2.17

$$-\frac{a\sqrt{e\cot(c+dx)}\left(8\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\tan^2(c+dx)\right)+\sqrt{2}\sqrt{\tan(c+dx)}\left(2\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)-2\tan^{-1}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x]),x]
```

```
[Out] -1/4*(a*Sqrt[e*Cot[c + d*x]]*(8*Hypergeometric2F1[-1/4, 1, 3/4, -Tan[c + d*
x]^2] + Sqrt[2]*(2*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] - 2*ArcTan[1 + Sq
rt[2]*Sqrt[Tan[c + d*x]]] + Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*
x]] - Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x]])*Sqrt[Tan[c + d*x]
]))/d
```

fricas [A] time = 0.65, size = 236, normalized size = 3.32

$$\left[\frac{\sqrt{2}\,a\sqrt{e}\,\log\left(-\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos(2\,dx+2\,c)-\sin(2\,dx+2\,c)-1)+2\,e\sin(2\,dx+2\,c)+e\right)-4\,a\sqrt{}}{2\,d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(2)*a*sqrt(e)*log(-sqrt(2)*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/
sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) - 1) + 2*e*sin(2*d*x
 + 2*c) + e) - 4*a*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/d, -(sq
```

```
rt(2)*a*sqrt(-e)*arctan(1/2*sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/
sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x +
2*c) + e)) + 2*a*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/d]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)\sqrt{e\cot(dx+c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c)),x, algorithm="giac")
[Out] integrate((a*cot(d*x + c) + a)*sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.43, size = 337, normalized size = 4.75

$$-\frac{2a\sqrt{e\cot(dx+c)}}{d}+\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d}+\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)*(a+cot(d*x+c)*a),x)
[Out] -2*a*(e*cot(d*x+c))^(1/2)/d+1/4*a/d*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2*a/d*(e^2)^(1/4)*2^(1/2)*a
rctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2*a/d*(e^2)^(1/4)*2^(1/
2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4*a/d*e*2^(1/2)/(e
^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(
1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-
1/2*a/d*e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)+1)+1/2*a/d*e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)+1)
```

maxima [A] time = 0.90, size = 108, normalized size = 1.52

$$\frac{\left(a\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)-\frac{4a\sqrt{\frac{e}{\tan(dx+c)}}}{e}\right)e}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*(a*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x +
c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan
(d*x + c))/sqrt(e)) - 4*a*sqrt(e/tan(d*x + c))/e)*e/d
```

mupad [B] time = 0.78, size = 128, normalized size = 1.80

$$-\frac{2\,a\,\sqrt{e\cot\left(c+d\,x\right)}}{d}-\frac{{\left(-1\right)}^{1/4}\,a\,\sqrt{e}\,\left(\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)-\mathrm{atanh}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)\right)}{d}-\frac{{\left(-1\right)}^{1/4}\,a\,\sqrt{e}\,\mathrm{atan}\left(\cdots\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)*(a + a*cot(c + d*x)),x)
```

```
[Out] - (2*a*(e*cot(c + d*x))^(1/2))/d - ((-1)^(1/4)*a*e^(1/2)*atan(((-1)^(1/4)*(
e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/d - ((-1)^(1/4)*a*e^(1/2)*atanh(((-1)^(
1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/d - ((-1)^(1/4)*a*e^(1/2)*(atan((
(-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)) - atanh(((-1)^(1/4)*(e*cot(c +
d*x))^(1/2))/e^(1/2))))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\int\sqrt{e\cot\left(c+dx\right)}\,dx+\int\sqrt{e\cot\left(c+dx\right)}\cot\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)*(a+a*cot(d*x+c)),x)
```

```
[Out] a*(Integral(sqrt(e*cot(c + d*x)), x) + Integral(sqrt(e*cot(c + d*x))*cot(c
+ d*x), x))
```

3.5 $\int \frac{a+a\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$

Optimal. Leaf size=49

$$\frac{\sqrt{2}\,a\tan^{-1}\left(\frac{\sqrt{e}\,(1-\cot(c+dx))}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d\sqrt{e}}$$

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

Rubi [A] time = 0.04, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {3532, 205}

$$\frac{\sqrt{2}\,a\tan^{-1}\left(\frac{\sqrt{e}\,(1-\cot(c+dx))}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (Sqrt[2]*a*ArcTan[(Sqrt[e]*(1 - Cot[c + d*x]))/(Sqrt[2]*Sqrt[e*Cot[c + d*x]
])])/(d*Sqrt[e])
```

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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rubi steps

$$\int \frac{a+a\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx = -\frac{(2a^2)\,\text{Subst}\left(\int \frac{1}{-2a^2-ex^2}\,dx, x, \frac{a-a\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\right)}{d}$$
$$= \frac{\sqrt{2}\,a\tan^{-1}\left(\frac{\sqrt{e}\,(1-\cot(c+dx))}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d\sqrt{e}}$$

Mathematica [C] time = 0.22, size = 165, normalized size = 3.37

$$\frac{a\left(8\tan^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\tan^2(c+dx)\right)+3\sqrt{2}\left(-2\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)+2\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+\right.\right.\right.}{12d\sqrt{\tan(c+dx)}\sqrt{e\,\text{co}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (a*(3*Sqrt[2]*(-2*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] + 2*ArcTan[1 + Sqr
t[2]*Sqrt[Tan[c + d*x]]] - Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x
]] + Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x]]) + 8*Hypergeometric
2F1[3/4, 1, 7/4, -Tan[c + d*x]^2]*Tan[c + d*x]^(3/2)))/(12*d*Sqrt[e*Cot[c +
 d*x]]*Sqrt[Tan[c + d*x]])
```

fricas [B] time = 0.60, size = 172, normalized size = 3.51

$$\left[\frac{\sqrt{2}\,a\sqrt{-\frac{1}{e}}\,\log\left(-\sqrt{2}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\sqrt{-\frac{1}{e}}\,(\cos(2\,dx+2\,c)+\sin(2\,dx+2\,c)-1)-2\,\sin(2\,dx+2\,c)+1\right)}{2\,d}, \frac{\sqrt{2}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(2)*a*sqrt(-1/e)*log(-sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*
d*x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) - 1) - 2*sin(2*
d*x + 2*c) + 1)/d, sqrt(2)*a*arctan(-1/2*sqrt(2)*sqrt((e*cos(2*d*x + 2*c) +
 e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(sqrt(e)*(c
os(2*d*x + 2*c) + 1)))/(d*sqrt(e))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a\cot(dx+c)+a}{\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)/sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.43, size = 327, normalized size = 6.67

$$-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4de}-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2de}+\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)/(e*cot(d*x+c))^(1/2),x)
```

```
[Out] -1/4*a/d/e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2)))-1/2*a/d/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)+1/2*a/d/e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4*a/d*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x
+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/2*a/d*2^(1/2)/(e^2)^(
1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2*a/d*2^(1/2)/(e^
2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [B] time = 0.69, size = 83, normalized size = 1.69

$$-\frac{a\left(\frac{\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -a*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/s
qrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/t
an(d*x + c)))/sqrt(e))/sqrt(e))/d
```

mupad [B] time = 0.73, size = 65, normalized size = 1.33

$$\frac{(-1)^{1/4}\,a\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)(-1+1\mathrm{i})}{d\,\sqrt{e}}+\frac{(-1)^{1/4}\,a\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)(1+1\mathrm{i})}{d\,\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))/(e*cot(c + d*x))^(1/2),x)
```

```
[Out] ((-1)^(1/4)*a*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*(1 + 1i))/
(d*e^(1/2)) - ((-1)^(1/4)*a*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2
))*(1 - 1i))/(d*e^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\int\frac{1}{\sqrt{e\cot(c+dx)}}\,dx+\int\frac{\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))**(1/2),x)
```

```
[Out] a*(Integral(1/sqrt(e*cot(c + d*x)), x) + Integral(cot(c + d*x)/sqrt(e*cot(c
 + d*x)), x))
```

3.6 $\int \frac{a+a\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=75

$$\frac{2a}{de\sqrt{e\cot(c+dx)}}-\frac{\sqrt{2}\,a\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{3/2}}$$

```
[Out] -a*arctanh(1/2*(e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*2
^(1/2)/d/e^(3/2)+2*a/d/e/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3529, 3532, 208}

$$\frac{2a}{de\sqrt{e\cot(c+dx)}}-\frac{\sqrt{2}\,a\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] -((Sqrt[2]*a*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c
 + d*x]])])/(d*e^(3/2))) + (2*a)/(d*e*Sqrt[e*Cot[c + d*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]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rubi steps

$$\int \frac{a+a\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx = \frac{2a}{de\sqrt{e\cot(c+dx)}} + \frac{\int \frac{ae-ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^2}$$
$$= \frac{2a}{de\sqrt{e\cot(c+dx)}} - \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{1}{2a^2e^2-ex^2}\,dx, x, \frac{ae+ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\right)}{d}$$
$$= -\frac{\sqrt{2}\,a\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{3/2}} + \frac{2a}{de\sqrt{e\cot(c+dx)}}$$

Mathematica [C] time = 0.26, size = 191, normalized size = 2.55

$$\frac{a\left(8\tan^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\tan^2(c+dx)\right)+6\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)-6\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+d\right.\right.}{12d\tan^{\frac{3}{2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (a*(6*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] - 6*Sqrt[2]*ArcTan[1 +
 Sqrt[2]*Sqrt[Tan[c + d*x]]] + 3*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]
 + Tan[c + d*x]] - 3*Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d
*x]] + 24*Sqrt[Tan[c + d*x]] + 8*Hypergeometric2F1[3/4, 1, 7/4, -Tan[c + d*
x]^2]*Tan[c + d*x]^(3/2)))/(12*d*(e*Cot[c + d*x])^(3/2)*Tan[c + d*x]^(3/2))
```

fricas [B] time = 0.53, size = 321, normalized size = 4.28

$$\left[\frac{4\,a\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\sin(2\,dx+2\,c)+\frac{\sqrt{2}\,(ae\cos(2\,dx+2\,c)+ae)\log\left(\frac{\sqrt{2}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}(\cos(2\,dx+2\,c)-\sin(2\,dx+2\,c)-1)}{\sqrt{e}}+2\sin(2\,dx+2\,c)+1\right.}{\sqrt{e}}}{2\left(de^2\cos(2\,dx+2\,c)+de^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] [1/2*(4*a*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c)
+ sqrt(2)*(a*e*cos(2*d*x + 2*c) + a*e)*log(sqrt(2)*sqrt((e*cos(2*d*x + 2*c)
 + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) - 1)/sqrt(e) +
 2*sin(2*d*x + 2*c) + 1)/sqrt(e))/(d*e^2*cos(2*d*x + 2*c) + d*e^2), (sqrt(2
)*(a*e*cos(2*d*x + 2*c) + a*e)*sqrt(-1/e)*arctan(1/2*sqrt(2)*sqrt((e*cos(2*
d*x + 2*c) + e)/sin(2*d*x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin(2*d*x
+ 2*c) + 1)/(cos(2*d*x + 2*c) + 1)) + 2*a*sqrt((e*cos(2*d*x + 2*c) + e)/sin
(2*d*x + 2*c))*sin(2*d*x + 2*c))/(d*e^2*cos(2*d*x + 2*c) + d*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a\cot(dx+c)+a}{(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)/(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.36, size = 355, normalized size = 4.73

$$-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d\,e^{2}}-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2d\,e^{2}}+\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)/(e*cot(d*x+c))^(3/2),x)
```

```
[Out] -1/4*a/d/e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
*2^(1/2)+(e^2)^(1/2)))-1/2*a/d/e^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2*a/d/e^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1
/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4*a/d/e*2^(1/2)/(e^2)^(1/4)*ln((e
*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*
x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2*a/d/e*2^(1/
2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2*a/d/e
*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2*
a/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.72, size = 111, normalized size = 1.48

$$-\frac{e\left(\frac{a\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{e^2}-\frac{4a}{e^2\sqrt{\frac{e}{\tan(dx+c)}}}\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*e*(a*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x
 + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/
tan(d*x + c))/sqrt(e))/e^2 - 4*a/(e^2*sqrt(e/tan(d*x + c))))/d
```

mupad [B] time = 0.96, size = 84, normalized size = 1.12

$$\frac{2a}{d\,e\,\sqrt{e\cot(c+d\,x)}}+\frac{(-1)^{1/4}\,a\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)(1+1\mathrm{i})}{d\,e^{3/2}}+\frac{(-1)^{1/4}\,a\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)(-1+1\mathrm{i})}{d\,e^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))/(e*cot(c + d*x))^(3/2),x)
```

```
[Out] (2*a)/(d*e*(e*cot(c + d*x))^(1/2)) + ((-1)^(1/4)*a*atan(((-1)^(1/4)*(e*cot(
c + d*x))^(1/2))/e^(1/2))*(1 + 1i))/(d*e^(3/2)) - ((-1)^(1/4)*a*atanh(((-1)
^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*(1 - 1i))/(d*e^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\int\frac{1}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx+\int\frac{\cot(c+dx)}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))**(3/2),x)
```

```
[Out] a*(Integral((e*cot(c + d*x))**(-3/2), x) + Integral(cot(c + d*x)/(e*cot(c +
 d*x))**(3/2), x))
```

3.7 $\int \frac{a+a\cot(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=99

$$-\frac{\sqrt{2}\,a\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{5/2}}+\frac{2a}{de^2\sqrt{e\cot(c+dx)}}+\frac{2a}{3de(e\cot(c+dx))^{3/2}}$$

```
[Out] 2/3*a/d/e/(e*cot(d*x+c))^(3/2)-a*arctan(1/2*(e^(1/2)-cot(d*x+c)*e^(1/2))*2^
(1/2)/(e*cot(d*x+c))^(1/2))*2^(1/2)/d/e^(5/2)+2*a/d/e^2/(e*cot(d*x+c))^(1/2
)
```

Rubi [A] time = 0.13, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3529, 3532, 205}

$$\frac{2a}{de^2\sqrt{e\cot(c+dx)}}-\frac{\sqrt{2}\,a\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{5/2}}+\frac{2a}{3de(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] -((Sqrt[2]*a*ArcTan[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c
+ d*x]])])/(d*e^(5/2))) + (2*a)/(3*d*e*(e*Cot[c + d*x])^(3/2)) + (2*a)/(d*e
^2*Sqrt[e*Cot[c + d*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 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
```

```
d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rubi steps

$$\int \frac{a+a\cot(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx = \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{\int \frac{ae-ae\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{e^2}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2a}{de^2\sqrt{e\cot(c+dx)}} + \frac{\int \frac{-ae^2-ae^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^4}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2a}{de^2\sqrt{e\cot(c+dx)}} - \frac{(2a^2)\,\mathrm{Subst}\left(\int \frac{1}{-2a^2e^4-ex^2}\,dx, x, \frac{-ae^2+ae^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\right)}{d}$$

$$= -\frac{\sqrt{2}\,a\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{5/2}} + \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2a}{de^2\sqrt{e\cot(c+dx)}}$$

Mathematica [C] time = 0.42, size = 203, normalized size = 2.05

$$\frac{a\left(-8\tan^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\tan^2(c+dx)\right)+6\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)-6\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+\dots}\right.\right.}{\dots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (a*(6*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] - 6*Sqrt[2]*ArcTan[1 +
 Sqrt[2]*Sqrt[Tan[c + d*x]]] + 3*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]
 + Tan[c + d*x]] - 3*Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d
*x]] + 24*Sqrt[Tan[c + d*x]] + 8*Tan[c + d*x]^(3/2) - 8*Hypergeometric2F1[3
/4, 1, 7/4, -Tan[c + d*x]^2]*Tan[c + d*x]^(3/2)))/(12*d*(e*Cot[c + d*x])^(5
/2)*Tan[c + d*x]^(5/2))
```

fricas [B] time = 0.82, size = 358, normalized size = 3.62

$$\left[\frac{3\sqrt{2}\left(ae\cos\left(2\,dx+2\,c\right)+ae\right)\sqrt{-\frac{1}{e}}\,\log\left(\sqrt{2}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\sqrt{-\frac{1}{e}}\left(\cos\left(2\,dx+2\,c\right)+\sin\left(2\,dx+2\,c\right)-1\right)-2\sin\cdots}{6\left(de^{3}\cos\left(2\,dx+2\,c\right)+de^{3}\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] [1/6*(3*sqrt(2)*(a*e*cos(2*d*x + 2*c) + a*e)*sqrt(-1/e)*log(sqrt(2)*sqrt((e
*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin
(2*d*x + 2*c) - 1) - 2*sin(2*d*x + 2*c) + 1) - 4*(a*cos(2*d*x + 2*c) - 3*a*
sin(2*d*x + 2*c) - a)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e
^3*cos(2*d*x + 2*c) + d*e^3), -1/3*(3*sqrt(2)*(a*e*cos(2*d*x + 2*c) + a*e)*
arctan(-1/2*sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*
d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(sqrt(e)*(cos(2*d*x + 2*c) + 1)))/sqrt(e
) + 2*(a*cos(2*d*x + 2*c) - 3*a*sin(2*d*x + 2*c) - a)*sqrt((e*cos(2*d*x + 2
*c) + e)/sin(2*d*x + 2*c)))/(d*e^3*cos(2*d*x + 2*c) + d*e^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a\cot\left(dx+c\right)+a}{\left(e\cot\left(dx+c\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)/(e*cot(d*x + c))^(5/2), x)
```

maple [B] time = 0.36, size = 374, normalized size = 3.78

$$\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d\,e^{3}}+\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2d\,e^{3}}-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\cdots\right.}{2d\,e\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)/(e*cot(d*x+c))^(5/2),x)
```

```
[Out] 1/4*a/d/e^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*
2^(1/2)+(e^2)^(1/2)))+1/2*a/d/e^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^
(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2*a/d/e^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4*a/d/e^2*2^(1/2)/(e^2)^(1/4)*ln((
e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d
*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2*a/d/e^2*2^
(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2*a/
d/e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)+2*a/d/e^2/(e*cot(d*x+c))^(1/2)+2/3*a/d/e/(e*cot(d*x+c))^(3/2)
```

maxima [A] time = 0.60, size = 123, normalized size = 1.24

$$\frac{e\left(\frac{3a\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{e^3}+\frac{2\left(ae+\frac{3ae}{\tan(dx+c)}\right)}{e^3\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}\right)}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*e*(3*a*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x
+ c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*
sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/e^3 + 2*(a*e + 3*a*e/tan(d*x + c))/
(e^3*(e/tan(d*x + c))^(3/2)))/d
```

mupad [B] time = 1.48, size = 103, normalized size = 1.04

$$\frac{2a}{d\,e^2\sqrt{e\cot(c+d\,x)}}+\frac{2a}{3\,d\,e\,(e\cot(c+d\,x))^{3/2}}+\frac{(-1)^{1/4}\,a\,\mathrm{atan}\left(\frac{(-1)^{1/4}\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)(1-\mathrm{i})}{d\,e^{5/2}}+\frac{(-1)^{1/4}\,a\,\mathrm{atanh}\left(\frac{(-1)^{1/4}}{}\right.}{d\,e^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))/(e*cot(c + d*x))^(5/2),x)
```

```
[Out] (2*a)/(d*e^2*(e*cot(c + d*x))^(1/2)) + (2*a)/(3*d*e*(e*cot(c + d*x))^(3/2))
 + ((-1)^(1/4)*a*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*(1 - 1i)
```

```
)/(d*e^(5/2)) - ((-1)^(1/4)*a*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(
1/2))*(1 + 1i))/(d*e^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\int \frac{1}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx + \int \frac{\cot(c+dx)}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))/(e*cot(d*x+c))**(5/2),x)
```

```
[Out] a*(Integral((e*cot(c + d*x))**(-5/2), x) + Integral(cot(c + d*x)/(e*cot(c +
 d*x))**(5/2), x))
```

3.8 $\int (e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^2\,dx$

Optimal. Leaf size=269

$$\frac{a^2e^{5/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-\frac{a^2e^{5/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-$$

```
[Out] -4/5*a^2*(e*cot(d*x+c))^(5/2)/d-2/7*a^2*(e*cot(d*x+c))^(7/2)/d/e+1/2*a^2*e^
(5/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)
-1/2*a^2*e^(5/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2)
)/d*2^(1/2)+a^2*e^(5/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1
/2)/d-a^2*e^(5/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/d+
4*a^2*e^2*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.29, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3543, 12, 16, 3473, 3476, 329, 211, 1165, 628, 1162, 617, 204}

$$\frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d}+\frac{a^2e^{5/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-\frac{a^2e^{5/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\cdots\right)}{\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^2,x]
```

```
[Out] (Sqrt[2]*a^2*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/d
- (Sqrt[2]*a^2*e^(5/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/
d + (4*a^2*e^2*Sqrt[e*Cot[c + d*x]])/d - (4*a^2*(e*Cot[c + d*x])^(5/2))/(5*
d) - (2*a^2*(e*Cot[c + d*x])^(7/2))/(7*d*e) + (a^2*e^(5/2)*Log[Sqrt[e] + Sq
rt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d) - (a^2*e^(5
/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sq
rt[2]*d)
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 329

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

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 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 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 3473

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(b*Tan[c + d
*x])^(n - 1))/(d*(n - 1)), x] - Dist[b^2, Int[(b*Tan[c + d*x])^(n - 2), x],
 x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1]
```

Rule 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int (e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^2\,dx = -\frac{2a^2(e\cot(c+dx))^{7/2}}{7de} + \int 2a^2\cot(c+dx)(e\cot(c+dx))^{5/2}\,dx$$
$$= -\frac{2a^2(e\cot(c+dx))^{7/2}}{7de} + \left(2a^2\right)\int \cot(c+dx)(e\cot(c+dx))^{5/2}\,dx$$
$$= -\frac{2a^2(e\cot(c+dx))^{7/2}}{7de} + \frac{\left(2a^2\right)\int (e\cot(c+dx))^{7/2}\,dx}{e}$$
$$= -\frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de} - \left(2a^2e\right)\int (e\cot(c+$$
$$= \frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d} - \frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de}$$
$$= \frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d} - \frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de}$$
$$= \frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d} - \frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de}$$
$$= \frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d} - \frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de}$$
$$= \frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d} - \frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de}$$
$$= \frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d} - \frac{4a^2(e\cot(c+dx))^{5/2}}{5d} - \frac{2a^2(e\cot(c+dx))^{7/2}}{7de}$$
$$= \frac{\sqrt{2}\,a^2e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{d} - \frac{\sqrt{2}\,a^2e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\,\sqrt{e\cot(c}}{\sqrt{e}}\right.}{d}$$

Mathematica [A] time = 1.19, size = 187, normalized size = 0.70

$$-\frac{a^2(e\cot(c+dx))^{5/2}\left(20\cot^{\frac{7}{2}}(c+dx)+56\cot^{\frac{5}{2}}(c+dx)-280\sqrt{\cot(c+dx)}-35\sqrt{2}\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^2,x]
```

```
[Out] -1/70*(a^2*(e*Cot[c + d*x])^(5/2)*(-70*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[
c + d*x]]] + 70*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] - 280*Sqrt[C
ot[c + d*x]] + 56*Cot[c + d*x]^(5/2) + 20*Cot[c + d*x]^(7/2) - 35*Sqrt[2]*L
og[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] + 35*Sqrt[2]*Log[1 + Sqrt
[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/(d*Cot[c + d*x]^(5/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)^2 (e\cot(dx+c))^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2*(e*cot(d*x + c))^(5/2), x)
```

maple [A] time = 0.61, size = 234, normalized size = 0.87

$$-\frac{2a^2(e\cot(dx+c))^{\frac{7}{2}}}{7de}-\frac{4a^2(e\cot(dx+c))^{\frac{5}{2}}}{5d}+\frac{4a^2e^2\sqrt{e\cot(dx+c)}}{d}+\frac{a^2e^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)*(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -2/7*a^2*(e*cot(d*x+c))^(7/2)/d/e-4/5*a^2*(e*cot(d*x+c))^(5/2)/d+4*a^2*e^2*
(e*cot(d*x+c))^(1/2)/d+1/d*a^2*e^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*a^2*e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot
(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)
-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^2*e^2*(e^2)^(
1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.59, size = 232, normalized size = 0.86

$$-\frac{\left(35\left(2\sqrt{2}e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)+2\sqrt{2}e^{\frac{3}{2}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)+\sqrt{2}e^{\frac{3}{2}}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/70*(35*(2*sqrt(2)*e^(3/2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e
/tan(d*x + c)))/sqrt(e)) + 2*sqrt(2)*e^(3/2)*arctan(-1/2*sqrt(2)*(sqrt(2)*s
qrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e)) + sqrt(2)*e^(3/2)*log(sqrt(2)*sqr
t(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c)) - sqrt(2)*e^(3/2)*log(-sqrt
(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c)))*a^2 - 4*(70*a^2*e^3
*sqrt(e/tan(d*x + c)) - 14*a^2*e*(e/tan(d*x + c))^(5/2) - 5*a^2*(e/tan(d*x
+ c))^(7/2))/e^2)*e/d
```

mupad [B] time = 1.73, size = 125, normalized size = 0.46

$$\frac{4a^2e^2\sqrt{e\cot(c+dx)}}{d}-\frac{4a^2(e\cot(c+dx))^{5/2}}{5d}-\frac{2a^2(e\cot(c+dx))^{7/2}}{7de}+\frac{(-1)^{1/4}a^2e^{5/2}\,\mathrm{atan}\left(\frac{(-1)^{1/4}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)2i}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)*(a + a*cot(c + d*x))^2,x)
```

```
[Out] (4*a^2*e^2*(e*cot(c + d*x))^(1/2))/d - (4*a^2*(e*cot(c + d*x))^(5/2))/(5*d)
 - (2*a^2*(e*cot(c + d*x))^(7/2))/(7*d*e) + ((-1)^(1/4)*a^2*e^(5/2)*atan(((
-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*2i)/d + (2*(-1)^(1/4)*a^2*e^(5/2
)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2)*1i)/e^(1/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\int(e\cot(c+dx))^{\frac{5}{2}}\,dx+\int 2(e\cot(c+dx))^{\frac{5}{2}}\cot(c+dx)\,dx+\int(e\cot(c+dx))^{\frac{5}{2}}\cot^2(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)*(a+a*cot(d*x+c))**2,x)
```

```
[Out] a**2*(Integral((e*cot(c + d*x))**(5/2), x) + Integral(2*(e*cot(c + d*x))**(
5/2)*cot(c + d*x), x) + Integral((e*cot(c + d*x))**(5/2)*cot(c + d*x)**2, x
))
```

3.9 $\int (e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^2\,dx$

Optimal. Leaf size=246

$$\frac{a^2e^{3/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-\frac{a^2e^{3/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-$$

```
[Out] -4/3*a^2*(e*cot(d*x+c))^(3/2)/d-2/5*a^2*(e*cot(d*x+c))^(5/2)/d/e+1/2*a^2*e^
(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)
-1/2*a^2*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2)
)/d*2^(1/2)-a^2*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1
/2)/d+a^2*e^(3/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/d
```

Rubi [A] time = 0.23, antiderivative size = 246, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3543, 12, 16, 3473, 3476, 329, 297, 1162, 617, 204, 1165, 628}

$$\frac{a^2e^{3/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-\frac{a^2e^{3/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d}-$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^2,x]
```

```
[Out] -((Sqrt[2]*a^2*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/
d) + (Sqrt[2]*a^2*e^(3/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]
])/d - (4*a^2*(e*Cot[c + d*x])^(3/2))/(3*d) - (2*a^2*(e*Cot[c + d*x])^(5/2)
)/(5*d*e) + (a^2*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[
e*Cot[c + d*x]]])/(Sqrt[2]*d) - (a^2*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c +
d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d)
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 329

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

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 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 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 3473

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(b*Tan[c + d
*x])^(n - 1))/(d*(n - 1)), x] - Dist[b^2, Int[(b*Tan[c + d*x])^(n - 2), x],
 x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1]
```

Rule 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$
\begin{aligned}
\int (e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^2\,dx &= -\frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \int 2a^2\cot(c+dx)(e\cot(c+dx))^{3/2}\,dx \\
&= -\frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \left(2a^2\right)\int \cot(c+dx)(e\cot(c+dx))^{3/2}\,dx \\
&= -\frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \frac{\left(2a^2\right)\int (e\cot(c+dx))^{5/2}\,dx}{e} \\
&= -\frac{4a^2(e\cot(c+dx))^{3/2}}{3d} - \frac{2a^2(e\cot(c+dx))^{5/2}}{5de} - \left(2a^2e\right)\int \sqrt{e\cot(c+ \\
&= -\frac{4a^2(e\cot(c+dx))^{3/2}}{3d} - \frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \frac{\left(2a^2e^2\right)\text{Subst}\left(\int \frac{\sqrt{}}{e^2-}\right.}{} \\
&= -\frac{4a^2(e\cot(c+dx))^{3/2}}{3d} - \frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \frac{\left(4a^2e^2\right)\text{Subst}\left(\int \frac{x}{e^2-}\right.}{} \\
&= -\frac{4a^2(e\cot(c+dx))^{3/2}}{3d} - \frac{2a^2(e\cot(c+dx))^{5/2}}{5de} - \frac{\left(2a^2e^2\right)\text{Subst}\left(\int \frac{e-}{e^2+}\right.}{} \\
&= -\frac{4a^2(e\cot(c+dx))^{3/2}}{3d} - \frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \frac{\left(a^2e^{3/2}\right)\text{Subst}\left(\int \frac{}{-e}\right.}{} \\
&= -\frac{4a^2(e\cot(c+dx))^{3/2}}{3d} - \frac{2a^2(e\cot(c+dx))^{5/2}}{5de} + \frac{a^2e^{3/2}\log\left(\sqrt{e}+\sqrt{e}\right.}{} \\
&= -\frac{\sqrt{2}\,a^2e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{d} + \frac{\sqrt{2}\,a^2e^{3/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot}}{\sqrt{e}}\right.}{d}
\end{aligned}
$$

Mathematica [C] time = 0.39, size = 52, normalized size = 0.21

$$
-\frac{2a^2(e\cot(c+dx))^{3/2}\left(-10\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)+3\cot(c+dx)+10\right)}{15d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^2,x]
```

```
[Out] (-2*a^2*(e*Cot[c + d*x])^(3/2)*(10 + 3*Cot[c + d*x] - 10*Hypergeometric2F1[
3/4, 1, 7/4, -Cot[c + d*x]^2]))/(15*d)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)^2 (e\cot(dx+c))^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2*(e*cot(d*x + c))^(3/2), x)
```

maple [A] time = 0.61, size = 213, normalized size = 0.87

$$-\frac{2a^2(e\cot(dx+c))^{\frac{5}{2}}}{5de}-\frac{4a^2(e\cot(dx+c))^{\frac{3}{2}}}{3d}+\frac{a^2e^2\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)-(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)+(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d(e^2)^{\frac{1}{4}}}+\frac{a^2e^2\sqrt{2}\,\arctan\left(\cdots\right.}{d(e\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)*(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -2/5*a^2*(e*cot(d*x+c))^(5/2)/d/e-4/3*a^2*(e*cot(d*x+c))^(3/2)/d+1/2/d*a^2*
e^2/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+
(e^2)^(1/2)))+1/d*a^2*e^2/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)+1)-1/d*a^2*e^2/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.60, size = 213, normalized size = 0.87

$$\frac{\left(15\,a^2e\left(\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}+\cdots\right.\right.}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/30*(15*a^2*e*(2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/ta
n(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt
(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*log(sqrt(2)*sqrt(e
)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*log(-sqrt(2)
*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e)) - 4*(10*a^2*e*
(e/tan(d*x + c))^(3/2) + 3*a^2*(e/tan(d*x + c))^(5/2))/e^2)*e/d
```

mupad [B] time = 0.95, size = 104, normalized size = 0.42

$$\frac{2\,{\left(-1\right)}^{1/4}\,a^2\,e^{3/2}\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\,\mathrm{cot}\left(c+d\,x\right)}}{\sqrt{e}}\right)}{d}-\frac{2\,a^2\,{\left(e\,\mathrm{cot}\left(c+d\,x\right)\right)}^{5/2}}{5\,d\,e}-\frac{4\,a^2\,{\left(e\,\mathrm{cot}\left(c+d\,x\right)\right)}^{3/2}}{3\,d}+\frac{{\left(-1\right)}^{1/4}\,a^2\,e^{3/2}\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1}}{}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)*(a + a*cot(c + d*x))^2,x)
```

```
[Out] (2*(-1)^(1/4)*a^2*e^(3/2)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))
)/d - (2*a^2*(e*cot(c + d*x))^(5/2))/(5*d*e) - (4*a^2*(e*cot(c + d*x))^(3/2
))/(3*d) + ((-1)^(1/4)*a^2*e^(3/2)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2)*
1i)/e^(1/2))*2i)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\int \left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\,dx+\int 2\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\cot\left(c+dx\right)dx+\int \left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\cot^{2}\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)*(a+a*cot(d*x+c))**2,x)
```

```
[Out] a**2*(Integral((e*cot(c + d*x))**(3/2), x) + Integral(2*(e*cot(c + d*x))**(
3/2)*cot(c + d*x), x) + Integral((e*cot(c + d*x))**(3/2)*cot(c + d*x)**2, x
))
```

3.10 $\int \sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2\,dx$

Optimal. Leaf size=244

$$-\frac{2a^2(e\cot(c+dx))^{3/2}}{3de}-\frac{4a^2\sqrt{e\cot(c+dx)}}{d}-\frac{a^2\sqrt{e}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,d}+\frac{a^2\sqrt{e}\log\left(\right.}{}$$

```
[Out] -2/3*a^2*(e*cot(d*x+c))^(3/2)/d/e-1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(
1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)+1/2*a^2*ln(e^(1/2)+cot(d*x+c)*
e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)-a^2*arctan(1-2^(1/2
)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)*e^(1/2)/d+a^2*arctan(1+2^(1/2)*(e*c
ot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)*e^(1/2)/d-4*a^2*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.23, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3543, 12, 16, 3473, 3476, 329, 211, 1165, 628, 1162, 617, 204}

$$-\frac{2a^2(e\cot(c+dx))^{3/2}}{3de}-\frac{4a^2\sqrt{e\cot(c+dx)}}{d}-\frac{a^2\sqrt{e}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,d}+\frac{a^2\sqrt{e}\log\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^2,x]
```

```
[Out] -((Sqrt[2]*a^2*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/
d) + (Sqrt[2]*a^2*Sqrt[e]*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]
])/d - (4*a^2*Sqrt[e*Cot[c + d*x]])/d - (2*a^2*(e*Cot[c + d*x])^(3/2))/(3*d
*e) - (a^2*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[
c + d*x]]])/(Sqrt[2]*d) + (a^2*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] +
 Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d)
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 329

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

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 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 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 3473

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(b*Tan[c + d
*x])^(n - 1))/(d*(n - 1)), x] - Dist[b^2, Int[(b*Tan[c + d*x])^(n - 2), x],
 x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1]
```

Rule 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int \sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2\,dx = -\frac{2a^2(e\cot(c+dx))^{3/2}}{3de} + \int 2a^2\cot(c+dx)\sqrt{e\cot(c+dx)}\,dx$$
$$= -\frac{2a^2(e\cot(c+dx))^{3/2}}{3de} + \left(2a^2\right)\int \cot(c+dx)\sqrt{e\cot(c+dx)}\,dx$$
$$= -\frac{2a^2(e\cot(c+dx))^{3/2}}{3de} + \frac{\left(2a^2\right)\int (e\cot(c+dx))^{3/2}\,dx}{e}$$
$$= -\frac{4a^2\sqrt{e\cot(c+dx)}}{d} - \frac{2a^2(e\cot(c+dx))^{3/2}}{3de} - \left(2a^2e\right)\int \frac{1}{\sqrt{e\cot(c+dx}}$$
$$= -\frac{4a^2\sqrt{e\cot(c+dx)}}{d} - \frac{2a^2(e\cot(c+dx))^{3/2}}{3de} + \frac{\left(2a^2e^2\right)\mathrm{Subst}\left(\int \frac{1}{\sqrt{x}\,(e^2}\right.}{}$$
$$= -\frac{4a^2\sqrt{e\cot(c+dx)}}{d} - \frac{2a^2(e\cot(c+dx))^{3/2}}{3de} + \frac{\left(4a^2e^2\right)\mathrm{Subst}\left(\int \frac{1}{e^2+x^4}\right.}{d}$$
$$= -\frac{4a^2\sqrt{e\cot(c+dx)}}{d} - \frac{2a^2(e\cot(c+dx))^{3/2}}{3de} + \frac{\left(2a^2e\right)\mathrm{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,d\right.}{d}$$
$$= -\frac{4a^2\sqrt{e\cot(c+dx)}}{d} - \frac{2a^2(e\cot(c+dx))^{3/2}}{3de} - \frac{\left(a^2\sqrt{e}\right)\mathrm{Subst}\left(\int \frac{\sqrt{2}}{-e-\sqrt{2}}\right.}{}$$
$$= -\frac{4a^2\sqrt{e\cot(c+dx)}}{d} - \frac{2a^2(e\cot(c+dx))^{3/2}}{3de} - \frac{a^2\sqrt{e}\,\log\left(\sqrt{e}+\sqrt{e}\,\mathrm{co}\right.}{}$$
$$= -\frac{\sqrt{2}\,a^2\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{d} + \frac{\sqrt{2}\,a^2\sqrt{e}\,\tan^{-1}\left(1+\frac{\sqrt{2}\,\sqrt{e\cot(c}}{\sqrt{e}}\right.}{d}$$

Mathematica [A] time = 0.43, size = 175, normalized size = 0.72

$$-\frac{a^2\sqrt{e\cot(c+dx)}\left(4\cot^{\frac{3}{2}}(c+dx)+24\sqrt{\cot(c+dx)}+3\sqrt{2}\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-3\sqrt{2}\log\right.}{6d\sqrt{\cot}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^2,x]
```

```
[Out] -1/6*(a^2*Sqrt[e*Cot[c + d*x]]*(6*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d
*x]]] - 6*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 24*Sqrt[Cot[c +
d*x]] + 4*Cot[c + d*x]^(3/2) + 3*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]
```

```
 + Cot[c + d*x]] - 3*Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d
*x]]))/(d*Sqrt[Cot[c + d*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot (dx+c)+a)^2\sqrt{e\cot (dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2*sqrt(e*cot(d*x + c)), x)
```

maple [A] time = 0.59, size = 204, normalized size = 0.84

$$-\frac{2a^2(e\cot (dx+c))^{\frac{3}{2}}}{3de}-\frac{4a^2\sqrt{e\cot (dx+c)}}{d}+\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d}-\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}}{}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)*(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -2/3*a^2*(e*cot(d*x+c))^(3/2)/d/e-4*a^2*(e*cot(d*x+c))^(1/2)/d+1/d*a^2*(e^2
)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^2*
(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2
/d*a^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/
2)+(e^2)^(1/2)))
```

maxima [A] time = 0.70, size = 211, normalized size = 0.86

$$\frac{\left(3\,a^2\left(\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}}{}\right.\right.}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/6*(3*a^2*(2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*
x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e)
- 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*log(sqrt(2)*sqrt(e)*sq
rt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqr
t(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e)) - 4*(6*a^2*e*sqrt(
e/tan(d*x + c)) + a^2*(e/tan(d*x + c))^(3/2))/e^2)*e/d
```

mupad [B] time = 0.70, size = 104, normalized size = 0.43

$$-\frac{4\,a^2\,\sqrt{e\cot\left(c+d\,x\right)}}{d}-\frac{2\,a^2\,{\left(e\cot\left(c+d\,x\right)\right)}^{3/2}}{3\,d\,e}-\frac{{\left(-1\right)}^{1/4}\,a^2\,\sqrt{e}\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot\left(c+d\,x\right)}}{\sqrt{e}}\right)\,2{}\mathrm{i}}{d}-\frac{2\,{\left(-1\right)}^{1/4}\,a^2\,\sqrt{e}\,\mathrm{atan}\left(\frac{(-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)*(a + a*cot(c + d*x))^2,x)
```

```
[Out] - (4*a^2*(e*cot(c + d*x))^(1/2))/d - (2*a^2*(e*cot(c + d*x))^(3/2))/(3*d*e)
 - ((-1)^(1/4)*a^2*e^(1/2)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)
)*2i)/d - (2*(-1)^(1/4)*a^2*e^(1/2)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2)
*1i)/e^(1/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\int\sqrt{e\cot\left(c+dx\right)}\,dx+\int 2\sqrt{e\cot\left(c+dx\right)}\cot\left(c+dx\right)dx+\int\sqrt{e\cot\left(c+dx\right)}\cot^{2}\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)*(a+a*cot(d*x+c))**2,x)
```

```
[Out] a**2*(Integral(sqrt(e*cot(c + d*x)), x) + Integral(2*sqrt(e*cot(c + d*x))*c
ot(c + d*x), x) + Integral(sqrt(e*cot(c + d*x))*cot(c + d*x)**2, x))
```

3.11 $\int \frac{(a+a\cot(c+dx))^2}{\sqrt{e\cot(c+dx)}}\,dx$

Optimal. Leaf size=222

$$-\frac{2a^2\sqrt{e\cot(c+dx)}}{de}-\frac{a^2\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d\sqrt{e}}+\frac{a^2\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}\right.}{\sqrt{2}d\sqrt{e}}$$

```
[Out] -1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1
/2)/e^(1/2)+1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1
/2))/d*2^(1/2)/e^(1/2)+a^2*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2
^(1/2)/d/e^(1/2)-a^2*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)
/d/e^(1/2)-2*a^2*(e*cot(d*x+c))^(1/2)/d/e
```

Rubi [A] time = 0.20, antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3543, 12, 16, 3476, 329, 297, 1162, 617, 204, 1165, 628}

$$-\frac{2a^2\sqrt{e\cot(c+dx)}}{de}-\frac{a^2\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}d\sqrt{e}}+\frac{a^2\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}\right.}{\sqrt{2}d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^2/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (Sqrt[2]*a^2*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*Sqrt[e]
) - (Sqrt[2]*a^2*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*Sqr
t[e]) - (2*a^2*Sqrt[e*Cot[c + d*x]])/(d*e) - (a^2*Log[Sqrt[e] + Sqrt[e]*Cot
[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d*Sqrt[e]) + (a^2*Log[S
qrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d*S
qrt[e])
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^2}{\sqrt{e\cot(c+dx)}}\,dx = -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} + \int \frac{2a^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} + \left(2a^2\right)\int \frac{\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} + \frac{\left(2a^2\right)\int \sqrt{e\cot(c+dx)}\,dx}{e}$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} - \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{\sqrt{x}}{e^2+x^2}\,dx, x, e\cot(c+dx)\right)}{d}$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} - \frac{\left(4a^2\right)\text{Subst}\left(\int \frac{x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d}$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} + \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d} - \frac{\left(2a^2\right)\text{Subst}\left(\int\right.}{}$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} - \frac{a^2\,\text{Subst}\left(\int \frac{1}{e-\sqrt{2}\sqrt{e}x+x^2}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d} - \frac{a^2\,\text{Subst}\left(\int\right.}{}$$

$$= -\frac{2a^2\sqrt{e\cot(c+dx)}}{de} - \frac{a^2\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}\right)}{\sqrt{2}d\sqrt{e}} + \frac{a^2\log\left(\right.}{}$$

$$= \frac{\sqrt{2}a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{d\sqrt{e}} - \frac{\sqrt{2}a^2\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{d\sqrt{e}} - \frac{2a^2\sqrt{e\cot(c+}}{de}$$

Mathematica [C] time = 0.26, size = 53, normalized size = 0.24

$$-\frac{2a^2\sqrt{e\cot(c+dx)}\left(2\cot(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)+3\right)}{3de}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^2/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (-2*a^2*Sqrt[e*Cot[c + d*x]]*(3 + 2*Cot[c + d*x]*Hypergeometric2F1[3/4, 1,
7/4, -Cot[c + d*x]^2]))/(3*d*e)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^2}{\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2/sqrt(e*cot(d*x + c)), x)
```

maple [A]   time = 0.54, size = 186, normalized size = 0.84

$$-\frac{2a^2\sqrt{e\cot(dx+c)}}{de}-\frac{a^2\sqrt{2}\ \ln\left(\frac{e\cot(dx+c)-(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)+(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{e^2}}\right)}{2d\left(e^2\right)^{\frac{1}{4}}}-\frac{a^2\sqrt{2}\ \arctan\left(\frac{\sqrt{2}\ \sqrt{e\cot(dx+c)}}{(e^2)^{\frac{1}{4}}}+1\right)}{d\left(e^2\right)^{\frac{1}{4}}}+\frac{a^2\sqrt{2}\ \mathrm{a}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^2/(e*cot(d*x+c))^(1/2),x)
```

```
[Out] -2*a^2*(e*cot(d*x+c))^(1/2)/d/e-1/2/d*a^2/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x
+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^2/(e^2)^(1/4)*2^(
1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^2/(e^2)^(1/4)
*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.79, size = 193, normalized size = 0.87

$$-\frac{\frac{a^2\left(\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}+\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(d}} \cdots\right.}{\sqrt{e}} \cdots\right.}{e} \cdots}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/2*(a^2*(2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x
 + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) -
 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*log(sqrt(2)*sqrt(e)*sqr
t(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*log(-sqrt(2)*sqrt
(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/e + 4*a^2*sqrt(e/ta
n(d*x + c))/e^2)*e/d
```

mupad [B] time = 0.44, size = 86, normalized size = 0.39

$$\frac{2\,(-1)^{1/4}\,a^2\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,\sqrt{e}}-\frac{2\,(-1)^{1/4}\,a^2\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,\sqrt{e}}-\frac{2\,a^2\,\sqrt{e\cot\left(c+d\,x\right)}}{d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^2/(e*cot(c + d*x))^(1/2),x)
```

```
[Out] (2*(-1)^(1/4)*a^2*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)))/(d*e^
(1/2)) - (2*(-1)^(1/4)*a^2*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)
))/(d*e^(1/2)) - (2*a^2*(e*cot(c + d*x))^(1/2))/(d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\int\frac{1}{\sqrt{e\cot\left(c+dx\right)}}\,dx+\int\frac{2\cot\left(c+dx\right)}{\sqrt{e\cot\left(c+dx\right)}}\,dx+\int\frac{\cot^2\left(c+dx\right)}{\sqrt{e\cot\left(c+dx\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**2/(e*cot(d*x+c))**(1/2),x)
```

```
[Out] a**2*(Integral(1/sqrt(e*cot(c + d*x)), x) + Integral(2*cot(c + d*x)/sqrt(e*
cot(c + d*x)), x) + Integral(cot(c + d*x)**2/sqrt(e*cot(c + d*x)), x))
```

3.12 $\int \frac{(a+a\cot(c+dx))^2}{(e\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=222

$$\frac{a^2\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}de^{3/2}}-\frac{a^2\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}de^{3/2}}+\frac{\sqrt{2}a^2\,\mathrm{t}}{}$$

```
[Out] 1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(3/
2)*2^(1/2)-1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/
2))/d/e^(3/2)*2^(1/2)+a^2*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^
(1/2)/d/e^(3/2)-a^2*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/
d/e^(3/2)+2*a^2/d/e/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {3542, 12, 3476, 329, 211, 1165, 628, 1162, 617, 204}

$$\frac{a^2\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}de^{3/2}}-\frac{a^2\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}de^{3/2}}+\frac{\sqrt{2}a^2\,\mathrm{t}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^2/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (Sqrt[2]*a^2*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*e^(3/2)
) - (Sqrt[2]*a^2*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*e^(
3/2)) + (2*a^2)/(d*e*Sqrt[e*Cot[c + d*x]]) + (a^2*Log[Sqrt[e] + Sqrt[e]*Cot
[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d*e^(3/2)) - (a^2*Log[S
qrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d*e
^(3/2))
```

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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
```

```
IntegerQ[n]
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^2}{(e\cot(c+dx))^{3/2}}\,dx = \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{\int \frac{2a^2e}{\sqrt{e\cot(c+dx)}}\,dx}{e^2}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{\left(2a^2\right)\int \frac{1}{\sqrt{e\cot(c+dx)}}\,dx}{e}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} - \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{1}{\sqrt{x}\left(e^2+x^2\right)}\,dx, x, e\cot(c+dx)\right)}{d}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} - \frac{\left(4a^2\right)\text{Subst}\left(\int \frac{1}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} - \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{de} - \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{e+}{e^2}\right.}{}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{a^2\,\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{\sqrt{2}\,de^{3/2}} + \frac{a^2\,\text{Subst}\left(\int\right.}{}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{a^2\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}\right)}{\sqrt{2}\,de^{3/2}} - \frac{a^2\log\left(\sqrt{\right.}{}$$

$$= \frac{\sqrt{2}\,a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{de^{3/2}} - \frac{\sqrt{2}\,a^2\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{de^{3/2}} + \frac{2a^2}{de\sqrt{e\cot(c+d}}$$

Mathematica [C] time = 1.81, size = 236, normalized size = 1.06

$$\frac{a^2(\cot(c+dx)+1)^2\left(3\sin(c+dx)\left(4\cos(c+dx)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)+\sqrt{2}\sin(c+dx)\cot^{\frac{3}{2}}(c+dx)\left(1\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^2/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (a^2*(1 + Cot[c + d*x])^2*(-4*Cos[c + d*x]^2*Cot[c + d*x]*Hypergeometric2F1
[3/4, 1, 7/4, -Cot[c + d*x]^2] + 3*Sin[c + d*x]*(4*Cos[c + d*x]*Hypergeomet
ric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] + Sqrt[2]*Cot[c + d*x]^(3/2)*(2*ArcTa
n[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]
] + Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sq
rt[Cot[c + d*x]] + Cot[c + d*x]])*Sin[c + d*x])))/(6*d*(e*Cot[c + d*x])^(3/
2)*(Cos[c + d*x] + Sin[c + d*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^2}{(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2/(e*cot(d*x + c))^(3/2), x)
```

maple [A] time = 0.48, size = 195, normalized size = 0.88

$$-\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d\,e^2}-\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d\,e^2}+\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\text{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^2/(e*cot(d*x+c))^(3/2),x)
```

```
[Out] -1/2/d*a^2/e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^2/e^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^2/e^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^
(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2*a^2/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.46, size = 202, normalized size = 0.91

$$-\frac{e\left(\frac{\frac{2\sqrt{2}a^2\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{e^{\frac{3}{2}}}+\frac{2\sqrt{2}a^2\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{e^{\frac{3}{2}}}+\frac{\sqrt{2}a^2\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{e^{\frac{3}{2}}}-\frac{\sqrt{2}a^2\log\left(-\sqrt{2}\sqrt{e}\cdots\right.}{\cdots}}{e}\cdots\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*e*((2*sqrt(2)*a^2*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d
*x + c)))/sqrt(e))/e^(3/2) + 2*sqrt(2)*a^2*arctan(-1/2*sqrt(2)*(sqrt(2)*sqr
t(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/e^(3/2) + sqrt(2)*a^2*log(sqrt(2)*s
qrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/e^(3/2) - sqrt(2)*a^2*log
(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/e^(3/2))/e - 4
*a^2/(e^2*sqrt(e/tan(d*x + c))))/d
```

mupad [B] time = 0.59, size = 86, normalized size = 0.39

$$\frac{2\,a^2}{d\,e\,\sqrt{e\,\cot\left(c+d\,x\right)}}+\frac{{\left(-1\right)}^{1/4}\,a^2\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\,\cot(c+d\,x)}}{\sqrt{e}}\right)\,2{}\mathrm{i}}{d\,e^{3/2}}+\frac{{\left(-1\right)}^{1/4}\,a^2\,\mathrm{atanh}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\,\cot(c+d\,x)}}{\sqrt{e}}\right)\,2{}\mathrm{i}}{d\,e^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^2/(e*cot(c + d*x))^(3/2),x)
```

```
[Out] (2*a^2)/(d*e*(e*cot(c + d*x))^(1/2)) + ((-1)^(1/4)*a^2*atan(((-1)^(1/4)*(e*
cot(c + d*x))^(1/2))/e^(1/2))*2i)/(d*e^(3/2)) + ((-1)^(1/4)*a^2*atanh(((-1)
^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*2i)/(d*e^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\int \frac{1}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx + \int \frac{2\cot(c+dx)}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx + \int \frac{\cot^2(c+dx)}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**2/(e*cot(d*x+c))**(3/2),x)
```

```
[Out] a**2*(Integral((e*cot(c + d*x))**(-3/2), x) + Integral(2*cot(c + d*x)/(e*co
t(c + d*x))**(3/2), x) + Integral(cot(c + d*x)**2/(e*cot(c + d*x))**(3/2),
x))
```

3.13 $\int \frac{(a+a\cot(c+dx))^2}{(e\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=247

$$\frac{a^2\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,de^{5/2}}-\frac{a^2\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,de^{5/2}}-\frac{\sqrt{2}\,a^2\,\mathrm{t}}{}$$

```
[Out] 2/3*a^2/d/e/(e*cot(d*x+c))^(3/2)+1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1
/2)*(e*cot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)-1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e
^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)-a^2*arctan(1-2^(1/2)
*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/d/e^(5/2)+a^2*arctan(1+2^(1/2)*(e*co
t(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/d/e^(5/2)+4*a^2/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.24, antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3542, 12, 3474, 3476, 329, 297, 1162, 617, 204, 1165, 628}

$$\frac{4a^2}{de^2\sqrt{e\cot(c+dx)}}+\frac{a^2\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,de^{5/2}}-\frac{a^2\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+}\right.}{\sqrt{2}\,de^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^2/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] -((Sqrt[2]*a^2*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*e^(5/
2))) + (Sqrt[2]*a^2*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*
e^(5/2)) + (2*a^2)/(3*d*e*(e*Cot[c + d*x])^(3/2)) + (4*a^2)/(d*e^2*Sqrt[e*C
ot[c + d*x]]) + (a^2*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Co
t[c + d*x]]])/(Sqrt[2]*d*e^(5/2)) - (a^2*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x]
 + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d*e^(5/2))
```

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 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 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 329

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

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 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 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 3474

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*Tan[c + d*x]
```

```
)^(n + 1)/(b*d*(n + 1)), x] - Dist[1/b^2, Int[(b*Tan[c + d*x])^(n + 2), x],
 x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1]
```

Rule 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^2}{(e\cot(c+dx))^{5/2}}\,dx = \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{\int \frac{2a^2e}{(e\cot(c+dx))^{3/2}}\,dx}{e^2}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{\left(2a^2\right)\int \frac{1}{(e\cot(c+dx))^{3/2}}\,dx}{e}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4a^2}{de^2\sqrt{e\cot(c+dx)}} - \frac{\left(2a^2\right)\int \sqrt{e\cot(c+dx)}\,dx}{e^3}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4a^2}{de^2\sqrt{e\cot(c+dx)}} + \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{\sqrt{x}}{e^2+x^2}\,dx, x, e\cot(c+d\right.}{de^2}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4a^2}{de^2\sqrt{e\cot(c+dx)}} + \frac{\left(4a^2\right)\text{Subst}\left(\int \frac{x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+}\right.}{de^2}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4a^2}{de^2\sqrt{e\cot(c+dx)}} - \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+}\right.}{de^2}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4a^2}{de^2\sqrt{e\cot(c+dx)}} + \frac{a^2\,\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\cot}\right.}{\sqrt{2}\,de^{5/2}}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4a^2}{de^2\sqrt{e\cot(c+dx)}} + \frac{a^2\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e}\right.}{\sqrt{2}\,de^{5/2}}$$

$$= -\frac{\sqrt{2}\,a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{de^{5/2}} + \frac{\sqrt{2}\,a^2\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{de^{5/2}} + \frac{2a^2}{3de(e\cot(c}$$

Mathematica [C] time = 1.26, size = 233, normalized size = 0.94

$$\frac{a^2(\tan(c+dx)+1)^2\left(48\cos^2(c+dx)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)+\sin(c+dx)\left(8\cos(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^2/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (a^2*(48*Cos[c + d*x]^2*Hypergeometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] +
Sin[c + d*x]*(8*Cos[c + d*x]*Hypergeometric2F1[-3/4, 1, 1/4, -Cot[c + d*x]^
2] + 3*Sqrt[2]*Cot[c + d*x]^(5/2)*(2*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]]
```

```
 - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + Log[1 - Sqrt[2]*Sqrt[Cot[c +
d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])
*Sin[c + d*x]))*(1 + Tan[c + d*x])^2)/(12*d*e^2*Sqrt[e*Cot[c + d*x]]*(Cos[c
 + d*x] + Sin[c + d*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^2}{(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2/(e*cot(d*x + c))^(5/2), x)
```

maple [A] time = 0.47, size = 216, normalized size = 0.87

$$\frac{a^2\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d\,e^2\left(e^2\right)^{\frac{1}{4}}}+\frac{a^2\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d\,e^2\left(e^2\right)^{\frac{1}{4}}}-\frac{a^2\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}\right.}{d\,e^2\left(e^2\right)^{\frac{1}{4}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^2/(e*cot(d*x+c))^(5/2),x)
```

```
[Out] 1/2/d*a^2/e^2/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2)))+1/d*a^2/e^2/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^2/e^2/(e^2)^(1/4)*2^(1/2)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/3*a^2/d/e/(e*cot(d*x+c))^(3/2)+4
*a^2/d/e^2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.54, size = 211, normalized size = 0.85

$$\frac{e\left(\frac{3\,a^{2}\left(\frac{2\,\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,\log\left(-\sqrt{2}\,\sqrt{e}\,\sqrt{\cdots}\right.}{\cdots}\right.}{e^{3}}\cdots\right.}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/6*e*(3*a^2*(2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(
d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e
) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*log(sqrt(2)*sqrt(e)*
sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*log(-sqrt(2)*s
qrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/e^3 + 4*(a^2*e +
 6*a^2*e/tan(d*x + c))/(e^3*(e/tan(d*x + c))^(3/2)))/d
```

mupad [B] time = 0.70, size = 99, normalized size = 0.40

$$\frac{4\,a^2\cot\left(c+d\,x\right)+\frac{2\,a^2}{3}}{d\,e\,{\left(e\cot\left(c+d\,x\right)\right)}^{3/2}}+\frac{2\,{\left(-1\right)}^{1/4}\,a^2\,\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot\left(c+d\,x\right)}}{\sqrt{e}}\right)}{d\,e^{5/2}}-\frac{2\,{\left(-1\right)}^{1/4}\,a^2\,\mathrm{atanh}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot\left(c+d\,x\right)}}{\sqrt{e}}\right)}{d\,e^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^2/(e*cot(c + d*x))^(5/2),x)
```

```
[Out] (4*a^2*cot(c + d*x) + (2*a^2)/3)/(d*e*(e*cot(c + d*x))^(3/2)) + (2*(-1)^(1/
4)*a^2*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)))/(d*e^(5/2)) - (2*
(-1)^(1/4)*a^2*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)))/(d*e^(5/
2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^{2}\left(\int \frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{5}{2}}}\,dx+\int \frac{2\cot\left(c+dx\right)}{\left(e\cot\left(c+dx\right)\right)^{\frac{5}{2}}}\,dx+\int \frac{\cot^{2}\left(c+dx\right)}{\left(e\cot\left(c+dx\right)\right)^{\frac{5}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**2/(e*cot(d*x+c))**(5/2),x)
```

```
[Out] a**2*(Integral((e*cot(c + d*x))**(-5/2), x) + Integral(2*cot(c + d*x)/(e*co
t(c + d*x))**(5/2), x) + Integral(cot(c + d*x)**2/(e*cot(c + d*x))**(5/2),
x))
```

3.14 $\int \frac{(a+a\cot(c+dx))^2}{(e\cot(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=249

$$-\frac{a^2\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,de^{7/2}}+\frac{a^2\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,de^{7/2}}-\frac{\sqrt{2}\,a}{}$$

```
[Out] 2/5*a^2/d/e/(e*cot(d*x+c))^(5/2)+4/3*a^2/d/e^2/(e*cot(d*x+c))^(3/2)-1/2*a^2
*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(7/2)*2^(1
/2)+1/2*a^2*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e
^(7/2)*2^(1/2)-a^2*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/d
/e^(7/2)+a^2*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*2^(1/2)/d/e^(7/
2)
```

Rubi [A] time = 0.24, antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3542, 12, 3474, 3476, 329, 211, 1165, 628, 1162, 617, 204}

$$\frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}}-\frac{a^2\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{\sqrt{2}\,de^{7/2}}+\frac{a^2\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot}\right.}{\sqrt{2}\,de^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^2/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] -((Sqrt[2]*a^2*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*e^(7/
2))) + (Sqrt[2]*a^2*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(d*
e^(7/2)) + (2*a^2)/(5*d*e*(e*Cot[c + d*x])^(5/2)) + (4*a^2)/(3*d*e^2*(e*Cot
[c + d*x])^(3/2)) - (a^2*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[
e*Cot[c + d*x]]])/(Sqrt[2]*d*e^(7/2)) + (a^2*Log[Sqrt[e] + Sqrt[e]*Cot[c +
d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(Sqrt[2]*d*e^(7/2))
```

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 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 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 329

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

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 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 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 3474

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*Tan[c + d*x]
```

```
)^(n + 1)/(b*d*(n + 1)), x] - Dist[1/b^2, Int[(b*Tan[c + d*x])^(n + 2), x],
 x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1]
```

Rule 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^2}{(e\cot(c+dx))^{7/2}}\,dx = \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{\int \frac{2a^2e}{(e\cot(c+dx))^{5/2}}\,dx}{e^2}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{\left(2a^2\right)\int \frac{1}{(e\cot(c+dx))^{5/2}}\,dx}{e}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}} - \frac{\left(2a^2\right)\int \frac{1}{\sqrt{e\cot(c+dx)}}\,dx}{e^3}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}} + \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{1}{\sqrt{x}\left(e^2+x^2\right)}\,dx, x, e\cot(\right.}{de^2}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}} + \frac{\left(4a^2\right)\text{Subst}\left(\int \frac{1}{e^2+x^4}\,dx, x, \sqrt{e\cot(c}\right.}{de^2}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}} + \frac{\left(2a^2\right)\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c}\right.}{de^3}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}} - \frac{a^2\,\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\,\text{co}}\right.}{\sqrt{2}\,de^{7/2}}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4a^2}{3de^2(e\cot(c+dx))^{3/2}} - \frac{a^2\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{\right.}}{\sqrt{2}\,de^{7/2}}$$

$$= -\frac{\sqrt{2}a^2\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{de^{7/2}} + \frac{\sqrt{2}a^2\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{de^{7/2}} + \frac{2a^2}{5de(e\cot(c+}$$

<u>**Mathematica**</u> **[C]** time = 0.41, size = 141, normalized size = 0.57

$$\frac{2a^2\sin(c+dx)(\tan(c+dx)+1)^2\left(10\cos(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)+15\cos(c+dx)\cot(c+dx)\,{}_2F_1\left(-\right.\right.}{15de^3\sqrt{e\cot(c+dx)}\,(\sin(c+dx)+\cos(c+dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^2/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] (2*a^2*Sin[c + d*x]*(10*Cos[c + d*x]*Hypergeometric2F1[-3/4, 1, 1/4, -Cot[c
 + d*x]^2] + 15*Cos[c + d*x]*Cot[c + d*x]*Hypergeometric2F1[-1/4, 1, 3/4, -
Cot[c + d*x]^2] + 3*Hypergeometric2F1[-5/4, 1, -1/4, -Cot[c + d*x]^2]*Sin[c
```

```
+ d*x])*(1 + Tan[c + d*x])^2)/(15*d*e^3*Sqrt[e*Cot[c + d*x]]*(Cos[c + d*x]
+ Sin[c + d*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^2}{(e\cot(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^2/(e*cot(d*x + c))^(7/2), x)
```

maple [A] time = 0.46, size = 216, normalized size = 0.87

$$\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d\,e^4}+\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d\,e^4}-\frac{a^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\text{arcta}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^2/(e*cot(d*x+c))^(7/2),x)
```

```
[Out] 1/2/d*a^2/e^4*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2)))+1/d*a^2/e^4*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^2/e^4*(e^2)^(1/4)*2^(1/2)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/5*a^2/d/e/(e*cot(d*x+c))^(5/2)+4
/3*a^2/d/e^2/(e*cot(d*x+c))^(3/2)
```

maxima [A] time = 0.69, size = 221, normalized size = 0.89

$$e\left(\frac{15\left(\frac{2\sqrt{2}\,a^2\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{e^{\frac{3}{2}}}+\frac{2\sqrt{2}\,a^2\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{e^{\frac{3}{2}}}+\frac{\sqrt{2}\,a^2\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{e^{\frac{3}{2}}}-\frac{\sqrt{2}\,a^2\log\Big(-\sqrt{2}\,\sqrt{e}}{}\right.}{e^3}\right.$$
$$\overline{\qquad\qquad 30\,d \qquad\qquad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/30*e*(15*(2*sqrt(2)*a^2*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/ta
n(d*x + c)))/sqrt(e))/e^(3/2) + 2*sqrt(2)*a^2*arctan(-1/2*sqrt(2)*(sqrt(2)*
sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/e^(3/2) + sqrt(2)*a^2*log(sqrt(2
)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/e^(3/2) - sqrt(2)*a^2*
log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/e^(3/2))/e^
3 + 4*(3*a^2*e + 10*a^2*e/tan(d*x + c))/(e^3*(e/tan(d*x + c))^(5/2)))/d
```

mupad [B] time = 1.29, size = 99, normalized size = 0.40

$$\frac{\frac{4\,a^2\cot(c+d\,x)}{3}+\frac{2\,a^2}{5}}{d\,e\,\left(e\cot\left(c+d\,x\right)\right)^{5/2}}-\frac{(-1)^{1/4}\,a^2\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)2\mathrm{i}}{d\,e^{7/2}}-\frac{(-1)^{1/4}\,a^2\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)2\mathrm{i}}{d\,e^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^2/(e*cot(c + d*x))^(7/2),x)
```

```
[Out] ((4*a^2*cot(c + d*x))/3 + (2*a^2)/5)/(d*e*(e*cot(c + d*x))^(5/2)) - ((-1)^(
1/4)*a^2*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*2i)/(d*e^(7/2))
- ((-1)^(1/4)*a^2*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*2i)/(d
*e^(7/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\int\frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{7}{2}}}\,dx+\int\frac{2\cot\left(c+dx\right)}{\left(e\cot\left(c+dx\right)\right)^{\frac{7}{2}}}\,dx+\int\frac{\cot^2\left(c+dx\right)}{\left(e\cot\left(c+dx\right)\right)^{\frac{7}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**2/(e*cot(d*x+c))**(7/2),x)
```

```
[Out] a**2*(Integral((e*cot(c + d*x))**(-7/2), x) + Integral(2*cot(c + d*x)/(e*co
t(c + d*x))**(7/2), x) + Integral(cot(c + d*x)**2/(e*cot(c + d*x))**(7/2),
x))
```

3.15 $\int (e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^3\,dx$

Optimal. Leaf size=186

$$\frac{2\sqrt{2}\,a^3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d}+\frac{4a^3e^2\sqrt{e\cot(c+dx)}}{d}-\frac{2\left(a^3\cot(c+dx)+a^3\right)(e\cot(c+dx))^{7/2}}{9de}-\frac{40a^3(e\cot(c}{63de}$$

```
[Out] 4/3*a^3*e*(e*cot(d*x+c))^(3/2)/d-4/5*a^3*(e*cot(d*x+c))^(5/2)/d-40/63*a^3*(
e*cot(d*x+c))^(7/2)/d/e-2/9*(e*cot(d*x+c))^(7/2)*(a^3+a^3*cot(d*x+c))/d/e+2
*a^3*e^(5/2)*arctan(1/2*(e^(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))
^(1/2))*2^(1/2)/d+4*a^3*e^2*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.30, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3566, 3630, 3528, 3532, 205}

$$\frac{4a^3e^2\sqrt{e\cot(c+dx)}}{d}+\frac{2\sqrt{2}\,a^3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{2\left(a^3\cot(c+dx)+a^3\right)(e\cot(c+dx))^{7/2}}{9de}-\frac{40a^3(e\cot(c}{63de}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (2*Sqrt[2]*a^3*e^(5/2)*ArcTan[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqr
t[e*Cot[c + d*x]])])/d + (4*a^3*e^2*Sqrt[e*Cot[c + d*x]])/d + (4*a^3*e*(e*C
ot[c + d*x])^(3/2))/(3*d) - (4*a^3*(e*Cot[c + d*x])^(5/2))/(5*d) - (40*a^3*
(e*Cot[c + d*x])^(7/2))/(63*d*e) - (2*(e*Cot[c + d*x])^(7/2)*(a^3 + a^3*Cot
[c + d*x]))/(9*d*e)
```

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 3528

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

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int (e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^3\,dx = -\frac{2(e\cot(c+dx))^{7/2}\left(a^3+a^3\cot(c+dx)\right)}{9de} - \frac{2\int (e\cot(c+dx))^{5/2}\left(-a\right.}{}$$

$$= -\frac{40a^3(e\cot(c+dx))^{7/2}}{63de} - \frac{2(e\cot(c+dx))^{7/2}\left(a^3+a^3\cot(c+dx)\right)}{9de} -$$

$$= -\frac{4a^3(e\cot(c+dx))^{5/2}}{5d} - \frac{40a^3(e\cot(c+dx))^{7/2}}{63de} - \frac{2(e\cot(c+dx))^{7/2}\left(\right.}{9}$$

$$= \frac{4a^3e(e\cot(c+dx))^{3/2}}{3d} - \frac{4a^3(e\cot(c+dx))^{5/2}}{5d} - \frac{40a^3(e\cot(c+dx))^{7/}}{63de}$$

$$= \frac{4a^3e^2\sqrt{e\cot(c+dx)}}{d} + \frac{4a^3e(e\cot(c+dx))^{3/2}}{3d} - \frac{4a^3(e\cot(c+dx))^{5/2}}{5d}$$

$$= \frac{4a^3e^2\sqrt{e\cot(c+dx)}}{d} + \frac{4a^3e(e\cot(c+dx))^{3/2}}{3d} - \frac{4a^3(e\cot(c+dx))^{5/2}}{5d}$$

$$= \frac{2\sqrt{2}\,a^3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d} + \frac{4a^3e^2\sqrt{e\cot(c+dx)}}{d} + \frac{4a^3e(e\,c}{}$$

Mathematica [C] time = 6.10, size = 729, normalized size = 3.92

$$-\frac{4\sin^3(c+dx)\tan(c+dx)(a\cot(c+dx)+a)^3(e\cot(c+dx))^{5/2}\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)}{3d(\sin(c+dx)+\cos(c+dx))^3} - \frac{2\sin(c+dx)\cos^2(c}{9d(s}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (-2*Cos[c + d*x]^2*(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3*Sin[c + d*
x])/(9*d*(Cos[c + d*x] + Sin[c + d*x])^3) - (6*Cos[c + d*x]*(e*Cot[c + d*x]
)^(5/2)*(a + a*Cot[c + d*x])^3*Sin[c + d*x]^2)/(7*d*(Cos[c + d*x] + Sin[c +
 d*x])^3) - (4*(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3*Sin[c + d*x]^3
)/(5*d*(Cos[c + d*x] + Sin[c + d*x])^3) + (Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[
Cot[c + d*x]]]*(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3*Sin[c + d*x]^3
)/(d*Cot[c + d*x]^(5/2)*(Cos[c + d*x] + Sin[c + d*x])^3) - (Sqrt[2]*ArcTan[
1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]*(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])
^3*Sin[c + d*x]^3)/(d*Cot[c + d*x]^(5/2)*(Cos[c + d*x] + Sin[c + d*x])^3) +
 ((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3*Log[1 - Sqrt[2]*Sqrt[Cot[c
+ d*x]] + Cot[c + d*x]]*Sin[c + d*x]^3)/(Sqrt[2]*d*Cot[c + d*x]^(5/2)*(Cos[
c + d*x] + Sin[c + d*x])^3) - ((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^
3*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]*Sin[c + d*x]^3)/(Sqrt[
```

```
2]*d*Cot[c + d*x]^(5/2)*(Cos[c + d*x] + Sin[c + d*x])^3) + (4*(e*Cot[c + d*
x])^(5/2)*(a + a*Cot[c + d*x])^3*Sin[c + d*x]^3*Tan[c + d*x])/(3*d*(Cos[c +
 d*x] + Sin[c + d*x])^3) - (4*(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3
*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2]*Sin[c + d*x]^3*Tan[c + d*x
])/(3*d*(Cos[c + d*x] + Sin[c + d*x])^3) + (4*(e*Cot[c + d*x])^(5/2)*(a + a
*Cot[c + d*x])^3*Sin[c + d*x]^3*Tan[c + d*x]^2)/(d*(Cos[c + d*x] + Sin[c +
d*x])^3)
```

fricas [A] time = 0.95, size = 535, normalized size = 2.88

$$\left[\frac{315\sqrt{2}\left(a^3e^2\cos\left(2\,dx+2\,c\right)^2-2\,a^3e^2\cos\left(2\,dx+2\,c\right)+a^3e^2\right)\sqrt{-e}\,\log\left(-\sqrt{2}\,\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos\left(2\,dx+\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [1/315*(315*sqrt(2)*(a^3*e^2*cos(2*d*x + 2*c)^2 - 2*a^3*e^2*cos(2*d*x + 2*c
) + a^3*e^2)*sqrt(-e)*log(-sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/s
in(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) - 1) - 2*e*sin(2*d*x
+ 2*c) + e) + 2*(721*a^3*e^2*cos(2*d*x + 2*c)^2 - 1330*a^3*e^2*cos(2*d*x +
2*c) + 469*a^3*e^2 - 15*(23*a^3*e^2*cos(2*d*x + 2*c) - 5*a^3*e^2)*sin(2*d*x
 + 2*c))*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*cos(2*d*x + 2*
c)^2 - 2*d*cos(2*d*x + 2*c) + d), 2/315*(315*sqrt(2)*(a^3*e^2*cos(2*d*x + 2
*c)^2 - 2*a^3*e^2*cos(2*d*x + 2*c) + a^3*e^2)*sqrt(e)*arctan(-1/2*sqrt(2)*s
qrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) -
sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x + 2*c) + e)) + (721*a^3*e^2*cos(2*d*x +
2*c)^2 - 1330*a^3*e^2*cos(2*d*x + 2*c) + 469*a^3*e^2 - 15*(23*a^3*e^2*cos(2
*d*x + 2*c) - 5*a^3*e^2)*sin(2*d*x + 2*c))*sqrt((e*cos(2*d*x + 2*c) + e)/si
n(2*d*x + 2*c)))/(d*cos(2*d*x + 2*c)^2 - 2*d*cos(2*d*x + 2*c) + d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a\cot\left(dx+c\right)+a\right)^3\left(e\cot\left(dx+c\right)\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3*(e*cot(d*x + c))^(5/2), x)
```

maple [B] time = 0.79, size = 446, normalized size = 2.40

$$-\frac{2a^3 (e\cot(dx+c))^{\frac{9}{2}}}{9d\,e^2}-\frac{6a^3 (e\cot(dx+c))^{\frac{7}{2}}}{7de}-\frac{4a^3 (e\cot(dx+c))^{\frac{5}{2}}}{5d}+\frac{4a^3 e (e\cot(dx+c))^{\frac{3}{2}}}{3d}+\frac{4a^3 e^2\sqrt{e\cot(dx+c)}}{d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)*(a+cot(d*x+c)*a)^3,x)
```

```
[Out] -2/9/d*a^3/e^2*(e*cot(d*x+c))^(9/2)-6/7*a^3*(e*cot(d*x+c))^(7/2)/d/e-4/5*a^
3*(e*cot(d*x+c))^(5/2)/d+4/3*a^3*e*(e*cot(d*x+c))^(3/2)/d+4*a^3*e^2*(e*cot(
d*x+c))^(1/2)/d-1/2/d*a^3*e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^3*e^2*(e^2)^(1/4)*2^(1/2)*arc
tan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^3*e^2*(e^2)^(1/4)*2^(
1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*a^3*e^3*2^(1
/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(
e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1
/2)))-1/d*a^3*e^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x
+c))^(1/2)+1)+1/d*a^3*e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.50, size = 193, normalized size = 1.04

$$-\frac{2\left(315\,a^3e^2\left(\frac{\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}\right)-\frac{630\,a^3e^4\sqrt{\frac{e}{\tan(dx+c)}}+210\,a^3e^3\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}-}{}\right.}{315\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)*(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -2/315*(315*a^3*e^2*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e
/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqr
t(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e)) - (630*a^3*e^4*sqrt(e/tan(
d*x + c)) + 210*a^3*e^3*(e/tan(d*x + c))^(3/2) - 126*a^3*e^2*(e/tan(d*x + c
))^(5/2) - 135*a^3*e*(e/tan(d*x + c))^(7/2) - 35*a^3*(e/tan(d*x + c))^(9/2)
)/e^3)*e/d
```

mupad [B] time = 2.44, size = 177, normalized size = 0.95

$$\frac{4a^3e^2\sqrt{e\cot(c+dx)}}{d}-\frac{4a^3(e\cot(c+dx))^{5/2}}{5d}-\frac{6a^3(e\cot(c+dx))^{7/2}}{7de}-\frac{2a^3(e\cot(c+dx))^{9/2}}{9de^2}+\frac{4a^3e(e\cot(c+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)*(a + a*cot(c + d*x))^3,x)
```

```
[Out] (4*a^3*e^2*(e*cot(c + d*x))^(1/2))/d - (4*a^3*(e*cot(c + d*x))^(5/2))/(5*d)
 - (6*a^3*(e*cot(c + d*x))^(7/2))/(7*d*e) - (2*a^3*(e*cot(c + d*x))^(9/2))/
(9*d*e^2) + (4*a^3*e*(e*cot(c + d*x))^(3/2))/(3*d) - (2^(1/2)*a^3*e^(5/2)*(
2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2))) + 2*atan((2^(1/2)*(e*c
ot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c + d*x))^(3/2))/(2*e^(3/
2)))))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int(e\cot(c+dx))^{\frac{5}{2}}\,dx+\int 3(e\cot(c+dx))^{\frac{5}{2}}\cot(c+dx)\,dx+\int 3(e\cot(c+dx))^{\frac{5}{2}}\cot^2(c+dx)\,dx+\int(e$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)*(a+a*cot(d*x+c))**3,x)
```

```
[Out] a**3*(Integral((e*cot(c + d*x))**(5/2), x) + Integral(3*(e*cot(c + d*x))**(
5/2)*cot(c + d*x), x) + Integral(3*(e*cot(c + d*x))**(5/2)*cot(c + d*x)**2,
 x) + Integral((e*cot(c + d*x))**(5/2)*cot(c + d*x)**3, x))
```

3.16 $\int (e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^3\,dx$

Optimal. Leaf size=160

$$-\frac{2\sqrt{2}\,a^3e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{32a^3(e\cot(c+dx))^{5/2}}{35de}-\frac{4a^3(e\cot(c+dx))^{3/2}}{3d}+\frac{4a^3e\sqrt{e\cot(c+dx)}}{d}-\frac{2\left(a^3\,\mathrm{co}\right.}{}$$

```
[Out] -4/3*a^3*(e*cot(d*x+c))^(3/2)/d-32/35*a^3*(e*cot(d*x+c))^(5/2)/d/e-2/7*(e*c
ot(d*x+c))^(5/2)*(a^3+a^3*cot(d*x+c))/d/e-2*a^3*e^(3/2)*arctanh(1/2*(e^(1/2
)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*2^(1/2)/d+4*a^3*e*(e*co
t(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.26, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3566, 3630, 3528, 3532, 208}

$$-\frac{2\sqrt{2}\,a^3e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d}-\frac{32a^3(e\cot(c+dx))^{5/2}}{35de}-\frac{4a^3(e\cot(c+dx))^{3/2}}{3d}+\frac{4a^3e\sqrt{e\cot(c+dx)}}{d}-\frac{2\left(a^3\,\mathrm{co}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (-2*Sqrt[2]*a^3*e^(3/2)*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*S
qrt[e*Cot[c + d*x]])])/d + (4*a^3*e*Sqrt[e*Cot[c + d*x]])/d - (4*a^3*(e*Cot
[c + d*x])^(3/2))/(3*d) - (32*a^3*(e*Cot[c + d*x])^(5/2))/(35*d*e) - (2*(e*
Cot[c + d*x])^(5/2)*(a^3 + a^3*Cot[c + d*x]))/(7*d*e)
```

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 3528

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

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
```

```
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int (e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^3\,dx = -\frac{2(e\cot(c+dx))^{5/2}\left(a^3+a^3\cot(c+dx)\right)}{7de} - \frac{2\int (e\cot(c+dx))^{3/2}\left(-\right.}{}$$

$$= -\frac{32a^3(e\cot(c+dx))^{5/2}}{35de} - \frac{2(e\cot(c+dx))^{5/2}\left(a^3+a^3\cot(c+dx)\right)}{7de} -$$

$$= -\frac{4a^3(e\cot(c+dx))^{3/2}}{3d} - \frac{32a^3(e\cot(c+dx))^{5/2}}{35de} - \frac{2(e\cot(c+dx))^{5/2}}{}$$

$$= \frac{4a^3e\sqrt{e\cot(c+dx)}}{d} - \frac{4a^3(e\cot(c+dx))^{3/2}}{3d} - \frac{32a^3(e\cot(c+dx))^{5/2}}{35de}$$

$$= \frac{4a^3e\sqrt{e\cot(c+dx)}}{d} - \frac{4a^3(e\cot(c+dx))^{3/2}}{3d} - \frac{32a^3(e\cot(c+dx))^{5/2}}{35de}$$

$$= -\frac{2\sqrt{2}\,a^3e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d} + \frac{4a^3e\sqrt{e\cot(c+dx)}}{d} - \frac{4a^3(}{}$$

Mathematica [C] time = 2.81, size = 332, normalized size = 2.08

$$\frac{a^3\sin(c+dx)(\cot(c+dx)+1)^3(e\cot(c+dx))^{3/2}\left(280\sin^2(c+dx)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-60\,c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (a^3*(e*Cot[c + d*x])^(3/2)*(1 + Cot[c + d*x])^3*Sin[c + d*x]*(-60*Cos[c +
d*x]^2*Cot[c + d*x]^(3/2) + 210*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x
]]]*Sin[c + d*x]^2 - 210*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]*Sin
[c + d*x]^2 + 840*Sqrt[Cot[c + d*x]]*Sin[c + d*x]^2 - 280*Cot[c + d*x]^(3/2
)*Sin[c + d*x]^2 + 280*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -C
ot[c + d*x]^2]*Sin[c + d*x]^2 + 105*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*
x]] + Cot[c + d*x]]*Sin[c + d*x]^2 - 105*Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c
 + d*x]] + Cot[c + d*x]]*Sin[c + d*x]^2 - 126*Cot[c + d*x]^(3/2)*Sin[2*(c +
 d*x)]))/(210*d*Cot[c + d*x]^(3/2)*(Cos[c + d*x] + Sin[c + d*x])^3)
```

fricas [A] time = 0.72, size = 487, normalized size = 3.04

$$\left[\frac{105\sqrt{2}\left(a^3e\cos\left(2\,dx+2\,c\right)-a^3e\right)\sqrt{e}\,\log\left(\sqrt{2}\,\sqrt{e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\left(\cos\left(2\,dx+2\,c\right)-\sin\left(2\,dx+2\,c\right)-1\right)+2\,e\,\mathrm{si}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [1/105*(105*sqrt(2)*(a^3*e*cos(2*d*x + 2*c) - a^3*e)*sqrt(e)*log(sqrt(2)*sq
rt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - s
in(2*d*x + 2*c) - 1) + 2*e*sin(2*d*x + 2*c) + e)*sin(2*d*x + 2*c) - 2*(55*a
^3*e*cos(2*d*x + 2*c)^2 - 30*a^3*e*cos(2*d*x + 2*c) - 85*a^3*e - 21*(13*a^3
*e*cos(2*d*x + 2*c) - 7*a^3*e)*sin(2*d*x + 2*c))*sqrt((e*cos(2*d*x + 2*c) +
 e)/sin(2*d*x + 2*c)))/((d*cos(2*d*x + 2*c) - d)*sin(2*d*x + 2*c)), 2/105*(
105*sqrt(2)*(a^3*e*cos(2*d*x + 2*c) - a^3*e)*sqrt(-e)*arctan(1/2*sqrt(2)*sq
rt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) +
sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x + 2*c) + e))*sin(2*d*x + 2*c) - (55*a^3*
e*cos(2*d*x + 2*c)^2 - 30*a^3*e*cos(2*d*x + 2*c) - 85*a^3*e - 21*(13*a^3*e*
cos(2*d*x + 2*c) - 7*a^3*e)*sin(2*d*x + 2*c))*sqrt((e*cos(2*d*x + 2*c) + e)
/sin(2*d*x + 2*c)))/((d*cos(2*d*x + 2*c) - d)*sin(2*d*x + 2*c))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)^3 (e\cot(dx+c))^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3*(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.87, size = 419, normalized size = 2.62

$$-\frac{2a^3 (e\cot(dx+c))^{\frac{7}{2}}}{7d\,e^2}-\frac{6a^3 (e\cot(dx+c))^{\frac{5}{2}}}{5de}-\frac{4a^3 (e\cot(dx+c))^{\frac{3}{2}}}{3d}+\frac{4a^3 e\sqrt{e\cot(dx+c)}}{d}-\frac{a^3 e\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(\cdots}{e\cot(\cdots}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)*(a+cot(d*x+c)*a)^3,x)
```

```
[Out] -2/7/d*a^3/e^2*(e*cot(d*x+c))^(7/2)-6/5*a^3*(e*cot(d*x+c))^(5/2)/d/e-4/3*a^
3*(e*cot(d*x+c))^(3/2)/d+4*a^3*e*(e*cot(d*x+c))^(1/2)/d-1/2/d*a^3*e*(e^2)^(
1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2
)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
))-1/d*a^3*e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)+1)+1/d*a^3*e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)+1/2/d*a^3*e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d*a^3*e^2*2^(1/2)/(e^2)^(1/4)*arc
tan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^3*e^2*2^(1/2)/(e^2)^(
1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.47, size = 175, normalized size = 1.09

$$-\frac{\left(105\,a^3 e\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)-\frac{2\left(210\,a^3 e^3\sqrt{\frac{e}{\tan(dx+c)}}-70\,a^3 e^2\left(\frac{e}{\tan(dx+\cdots}\right.\right.}{\cdots}\cdots\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/105*(105*a^3*e*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e
/tan(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c))
+ e + e/tan(d*x + c))/sqrt(e)) - 2*(210*a^3*e^3*sqrt(e/tan(d*x + c)) - 70*a
^3*e^2*(e/tan(d*x + c))^(3/2) - 63*a^3*e*(e/tan(d*x + c))^(5/2) - 15*a^3*(e
/tan(d*x + c))^(7/2))/e^3)*e/d
```

mupad [B] time = 1.62, size = 143, normalized size = 0.89

$$\frac{4\,a^3\,e\,\sqrt{e\cot\left(c+d\,x\right)}}{d}-\frac{6\,a^3\,{\left(e\cot\left(c+d\,x\right)\right)}^{5/2}}{5\,d\,e}-\frac{2\,a^3\,{\left(e\cot\left(c+d\,x\right)\right)}^{7/2}}{7\,d\,e^2}-\frac{4\,a^3\,{\left(e\cot\left(c+d\,x\right)\right)}^{3/2}}{3\,d}+\frac{\sqrt{2}\,a^3\,e^{3/2}\,\mathrm{atan}\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)*(a + a*cot(c + d*x))^3,x)
```

```
[Out] (4*a^3*e*(e*cot(c + d*x))^(1/2))/d - (6*a^3*(e*cot(c + d*x))^(5/2))/(5*d*e)
 - (2*a^3*(e*cot(c + d*x))^(7/2))/(7*d*e^2) - (4*a^3*(e*cot(c + d*x))^(3/2)
)/(3*d) + (2^(1/2)*a^3*e^(3/2)*atan((2^(1/2)*a^6*e^(9/2)*(e*cot(c + d*x))^(
1/2)*32i)/(32*a^6*e^5 + 32*a^6*e^5*cot(c + d*x)))*2i)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int \left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\,dx+\int 3\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\cot\left(c+dx\right)dx+\int 3\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\cot^2\left(c+dx\right)dx+\int (e\,c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)*(a+a*cot(d*x+c))**3,x)
```

```
[Out] a**3*(Integral((e*cot(c + d*x))**(3/2), x) + Integral(3*(e*cot(c + d*x))**(
3/2)*cot(c + d*x), x) + Integral(3*(e*cot(c + d*x))**(3/2)*cot(c + d*x)**2,
 x) + Integral((e*cot(c + d*x))**(3/2)*cot(c + d*x)**3, x))
```

3.17 $\int \sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^3\,dx$

Optimal. Leaf size=138

$$-\frac{8a^3(e\cot(c+dx))^{3/2}}{5de}-\frac{4a^3\sqrt{e\cot(c+dx)}}{d}-\frac{2\left(a^3\cot(c+dx)+a^3\right)(e\cot(c+dx))^{3/2}}{5de}-\frac{2\sqrt{2}\,a^3\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,c}{\sqrt{2}\,\sqrt{e\,co}}\right.}{d}$$

```
[Out] -8/5*a^3*(e*cot(d*x+c))^(3/2)/d/e-2/5*(e*cot(d*x+c))^(3/2)*(a^3+a^3*cot(d*x
+c))/d/e-2*a^3*arctan(1/2*(e^(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c
))^(1/2))*2^(1/2)*e^(1/2)/d-4*a^3*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.20, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3566, 3630, 3528, 3532, 205}

$$-\frac{8a^3(e\cot(c+dx))^{3/2}}{5de}-\frac{4a^3\sqrt{e\cot(c+dx)}}{d}-\frac{2\left(a^3\cot(c+dx)+a^3\right)(e\cot(c+dx))^{3/2}}{5de}-\frac{2\sqrt{2}\,a^3\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,c}{\sqrt{2}\,\sqrt{e\,co}}\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (-2*Sqrt[2]*a^3*Sqrt[e]*ArcTan[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sq
rt[e*Cot[c + d*x]])])/d - (4*a^3*Sqrt[e*Cot[c + d*x]])/d - (8*a^3*(e*Cot[c
+ d*x])^(3/2))/(5*d*e) - (2*(e*Cot[c + d*x])^(3/2)*(a^3 + a^3*Cot[c + d*x])
)/(5*d*e)
```

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 3528

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

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
```

```
EqQ[c^2 - d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int \sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^3\,dx = -\frac{2(e\cot(c+dx))^{3/2}\left(a^3+a^3\cot(c+dx)\right)}{5de} - \frac{2\int\sqrt{e\cot(c+dx)}\left(-a^3e\right.}{}$$

$$= -\frac{8a^3(e\cot(c+dx))^{3/2}}{5de} - \frac{2(e\cot(c+dx))^{3/2}\left(a^3+a^3\cot(c+dx)\right)}{5de} - \frac{2}{}$$

$$= -\frac{4a^3\sqrt{e\cot(c+dx)}}{d} - \frac{8a^3(e\cot(c+dx))^{3/2}}{5de} - \frac{2(e\cot(c+dx))^{3/2}\left(a^3+\right.}{5de}$$

$$= -\frac{4a^3\sqrt{e\cot(c+dx)}}{d} - \frac{8a^3(e\cot(c+dx))^{3/2}}{5de} - \frac{2(e\cot(c+dx))^{3/2}\left(a^3+\right.}{5de}$$

$$= -\frac{2\sqrt{2}\,a^3\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d} - \frac{4a^3\sqrt{e\cot(c+dx)}}{d} - \frac{8a^3(e\cot(}{5d}$$

Mathematica [C] time = 1.55, size = 315, normalized size = 2.28

$$-\frac{a^3\sin(c+dx)(\cot(c+dx)+1)^3\sqrt{e\cot(c+dx)}\left(3\left(4\cos^2(c+dx)\sqrt{\cot(c+dx)}+40\sin^2(c+dx)\sqrt{\cot(c+dx)}+\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^3,x]
```

```
[Out] -1/30*(a^3*Sqrt[e*Cot[c + d*x]]*(1 + Cot[c + d*x])^3*Sin[c + d*x]*(-20*Sqrt
[Cot[c + d*x]]*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2]*Sin[2*(c + d
*x)] + 3*(4*Cos[c + d*x]^2*Sqrt[Cot[c + d*x]] + 10*Sqrt[2]*ArcTan[1 - Sqrt[
2]*Sqrt[Cot[c + d*x]]]*Sin[c + d*x]^2 - 10*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[
Cot[c + d*x]]]*Sin[c + d*x]^2 + 40*Sqrt[Cot[c + d*x]]*Sin[c + d*x]^2 + 5*Sq
rt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]*Sin[c + d*x]^2 - 5
*Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]*Sin[c + d*x]^2
+ 10*Sqrt[Cot[c + d*x]]*Sin[2*(c + d*x)])))/(d*Sqrt[Cot[c + d*x]]*(Cos[c +
d*x] + Sin[c + d*x])^3)
```

fricas [A] time = 0.72, size = 366, normalized size = 2.65

$$\left[\frac{5\,\sqrt{2}\left(a^{3}\cos\left(2\,dx+2\,c\right)-a^{3}\right)\sqrt{-e}\,\log\left(\sqrt{2}\,\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\left(\cos\left(2\,dx+2\,c\right)+\sin\left(2\,dx+2\,c\right)-1\right)-2\,e\,\mathrm{si}\cdots\right.}{5\left(d\cos\left(2\,dx+2\,c\right)-\cdots\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [1/5*(5*sqrt(2)*(a^3*cos(2*d*x + 2*c) - a^3)*sqrt(-e)*log(sqrt(2)*sqrt(-e)*
sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d
*x + 2*c) - 1) - 2*e*sin(2*d*x + 2*c) + e) - 2*(9*a^3*cos(2*d*x + 2*c) - 5*
a^3*sin(2*d*x + 2*c) - 11*a^3)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*
c)))/(d*cos(2*d*x + 2*c) - d), -2/5*(5*sqrt(2)*(a^3*cos(2*d*x + 2*c) - a^3)
*sqrt(e)*arctan(-1/2*sqrt(2)*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*
x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x + 2*c) + e
)) + (9*a^3*cos(2*d*x + 2*c) - 5*a^3*sin(2*d*x + 2*c) - 11*a^3)*sqrt((e*cos
(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*cos(2*d*x + 2*c) - d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a\cot(dx+c)+a)^{3}\sqrt{e\cot(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3*sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.96, size = 391, normalized size = 2.83

$$-\frac{2a^3 (e\cot (dx+c))^{\frac{5}{2}}}{5d\,e^2}-\frac{2a^3 (e\cot (dx+c))^{\frac{3}{2}}}{de}-\frac{4a^3\sqrt{e\cot (dx+c)}}{d}+\frac{a^3 \left(e^2\right)^{\frac{1}{4}} \sqrt{2}\ \ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{}}\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)*(a+cot(d*x+c)*a)^3,x)
```

```
[Out] -2/5/d*a^3/e^2*(e*cot(d*x+c))^(5/2)-2*a^3*(e*cot(d*x+c))^(3/2)/d/e-4*a^3*(e
*cot(d*x+c))^(1/2)/d+1/2/d*a^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(
1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d*a^3*(e^2)^(1/4)*2^(1/2)*arctan
(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^3*(e^2)^(1/4)*2^(1/2)*ar
ctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*a^3*e*2^(1/2)/(e^2)
^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d
*a^3*e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)-1/d*a^3*e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)+1)
```

maxima [A] time = 0.76, size = 149, normalized size = 1.08

$$\frac{2\left(5\,a^3\left(\frac{\sqrt{2}\ \arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\ \sqrt{e}+2\ \sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\ \sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\ \arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\ \sqrt{e}-2\ \sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\ \sqrt{e}}\right)}{\sqrt{e}}\right)-\frac{10\,a^3e^2\sqrt{\frac{e}{\tan(dx+c)}}+5\,a^3e\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}+a^3\left(\frac{e}{\tan(dx+c)}\right.}{e^3}}{5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 2/5*(5*a^3*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x
+ c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*
sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e)) - (10*a^3*e^2*sqrt(e/tan(d*x + c))
+ 5*a^3*e*(e/tan(d*x + c))^(3/2) + a^3*(e/tan(d*x + c))^(5/2))/e^3)*e/d
```

mupad [B] time = 0.99, size = 136, normalized size = 0.99

$$\frac{\sqrt{2}\ a^3\ \sqrt{e}\ \left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\ \sqrt{e\cot(c+d\,x)}}{2\ \sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\ \sqrt{e\cot(c+d\,x)}}{2\ \sqrt{e}}+\frac{\sqrt{2}\ (e\cot(c+d\,x))^{3/2}}{2\,e^{3/2}}\right)\right)}{d}-\frac{2\,a^3\,(e\cot(c+d\,x))^{3/2}}{d\,e}-\frac{2\,a^3\,(e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)*(a + a*cot(c + d*x))^3,x)
```

```
[Out] (2^(1/2)*a^3*e^(1/2)*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)))
+ 2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c +
 d*x))^(3/2))/(2*e^(3/2))))))/d - (2*a^3*(e*cot(c + d*x))^(3/2))/(d*e) - (2*
a^3*(e*cot(c + d*x))^(5/2))/(5*d*e^2) - (4*a^3*(e*cot(c + d*x))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int \sqrt{e\cot(c+dx)}\,dx + \int 3\sqrt{e\cot(c+dx)}\cot(c+dx)\,dx + \int 3\sqrt{e\cot(c+dx)}\cot^2(c+dx)\,dx + \int \sqrt{e\mathrm{co}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)*(a+a*cot(d*x+c))**3,x)
```

```
[Out] a**3*(Integral(sqrt(e*cot(c + d*x)), x) + Integral(3*sqrt(e*cot(c + d*x))*c
ot(c + d*x), x) + Integral(3*sqrt(e*cot(c + d*x))*cot(c + d*x)**2, x) + Int
egral(sqrt(e*cot(c + d*x))*cot(c + d*x)**3, x))
```

3.18 $\int \frac{(a+a\cot(c+dx))^3}{\sqrt{e\cot(c+dx)}}\,dx$

Optimal. Leaf size=117

$$-\frac{16a^3\sqrt{e\cot(c+dx)}}{3de}-\frac{2\left(a^3\cot(c+dx)+a^3\right)\sqrt{e\cot(c+dx)}}{3de}+\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d\sqrt{e}}$$

```
[Out] 2*a^3*arctanh(1/2*(e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2)
)*2^(1/2)/d/e^(1/2)-16/3*a^3*(e*cot(d*x+c))^(1/2)/d/e-2/3*(a^3+a^3*cot(d*x+
c))*(e*cot(d*x+c))^(1/2)/d/e
```

Rubi [A] time = 0.17, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3566, 3630, 3532, 208}

$$-\frac{16a^3\sqrt{e\cot(c+dx)}}{3de}-\frac{2\left(a^3\cot(c+dx)+a^3\right)\sqrt{e\cot(c+dx)}}{3de}+\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^3/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (2*Sqrt[2]*a^3*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot
[c + d*x]])])/(d*Sqrt[e]) - (16*a^3*Sqrt[e*Cot[c + d*x]])/(3*d*e) - (2*Sqrt
[e*Cot[c + d*x]]*(a^3 + a^3*Cot[c + d*x]))/(3*d*e)
```

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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
```

```
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^3}{\sqrt{e\cot(c+dx)}}\,dx = -\frac{2\sqrt{e\cot(c+dx)}\,\left(a^3+a^3\cot(c+dx)\right)}{3de} - \frac{2\int \frac{-a^3e-3a^3e\cot(c+dx)-4a^3e\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{3e}$$

$$= -\frac{16a^3\sqrt{e\cot(c+dx)}}{3de} - \frac{2\sqrt{e\cot(c+dx)}\,\left(a^3+a^3\cot(c+dx)\right)}{3de} - \frac{2\int \frac{3a^3e-3a^3e\cot(c+d}{\sqrt{e\cot(c+dx)}}}{3e}$$

$$= -\frac{16a^3\sqrt{e\cot(c+dx)}}{3de} - \frac{2\sqrt{e\cot(c+dx)}\,\left(a^3+a^3\cot(c+dx)\right)}{3de} + \frac{\left(12a^6e\right)\text{Subst}\left(\int\right.}{}$$

$$= \frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{d\sqrt{e}} - \frac{16a^3\sqrt{e\cot(c+dx)}}{3de} - \frac{2\sqrt{e\cot(c+dx)}\,\left(a^3+a^3\right.}{3de}$$

Mathematica [C] time = 5.17, size = 292, normalized size = 2.50

$$-\frac{a^3\sin(c+dx)(\cot(c+dx)+1)^3\left(8\cos^2(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)+18\sin(2(c+dx))+4\cos^2(c+d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^3/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] -1/6*(a^3*(1 + Cot[c + d*x])^3*Sin[c + d*x]*(4*Cos[c + d*x]^2 + 8*Cos[c + d
*x]^2*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2] + 6*Sqrt[2]*ArcTan[1
```

```
- Sqrt[2]*Sqrt[Cot[c + d*x]]]*Sqrt[Cot[c + d*x]]*Sin[c + d*x]^2 - 6*Sqrt[2]
*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]*Sqrt[Cot[c + d*x]]*Sin[c + d*x]^2 +
 3*Sqrt[2]*Sqrt[Cot[c + d*x]]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c +
d*x]]*Sin[c + d*x]^2 - 3*Sqrt[2]*Sqrt[Cot[c + d*x]]*Log[1 + Sqrt[2]*Sqrt[Co
t[c + d*x]] + Cot[c + d*x]]*Sin[c + d*x]^2 + 18*Sin[2*(c + d*x)]))/(d*Sqrt[
e*Cot[c + d*x]]*(Cos[c + d*x] + Sin[c + d*x])^3)
```

fricas [A] time = 0.84, size = 349, normalized size = 2.98

$$\left[\frac{3\sqrt{2}\,a^3\sqrt{e}\,\log\left(-\frac{\sqrt{2}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos(2\,dx+2\,c)-\sin(2\,dx+2\,c)-1)}{\sqrt{e}}+2\,\sin(2\,dx+2\,c)+1\right)\sin(2\,dx+2\,c)-2\left(a^3\cos(2\right.}{3\,de\sin(2\,dx+2\,c)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] [1/3*(3*sqrt(2)*a^3*sqrt(e)*log(-sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(
2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) - 1)/sqrt(e) + 2*sin(2*d
*x + 2*c) + 1)*sin(2*d*x + 2*c) - 2*(a^3*cos(2*d*x + 2*c) + 9*a^3*sin(2*d*x
 + 2*c) + a^3)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e*sin(2*
d*x + 2*c)), -2/3*(3*sqrt(2)*a^3*e*sqrt(-1/e)*arctan(1/2*sqrt(2)*sqrt((e*co
s(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin(2*
d*x + 2*c) + 1)/(cos(2*d*x + 2*c) + 1))*sin(2*d*x + 2*c) + (a^3*cos(2*d*x +
 2*c) + 9*a^3*sin(2*d*x + 2*c) + a^3)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d
*x + 2*c)))/(d*e*sin(2*d*x + 2*c))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^3}{\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3/sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.57, size = 379, normalized size = 3.24

$$-\frac{2a^3\,(e\cot(dx+c))^{\frac{3}{2}}}{3d\,e^2}-\frac{6a^3\sqrt{e\cot(dx+c)}}{de}+\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\;\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^2}}\right)}{2de}+\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\;\mathrm{arct}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^3/(e*cot(d*x+c))^(1/2),x)
```

```
[Out] -2/3/d*a^3/e^2*(e*cot(d*x+c))^(3/2)-6*a^3*(e*cot(d*x+c))^(1/2)/d/e+1/2/d*a^
3/e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+
(e^2)^(1/2)))+1/d*a^3/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)-1/d*a^3/e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*a^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^3*2^(1/2)/(e^2)^(1/4)*
arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^3*2^(1/2)/(e^2)^(1
/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.55, size = 136, normalized size = 1.16

$$\frac{\left(\frac{3\,a^{3}\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{e}-\frac{2\left(9\,a^{3}e\sqrt{\frac{e}{\tan(dx+c)}}+a^{3}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}\right)}{e^{3}}\right)e}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*(3*a^3*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*
x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e
/tan(d*x + c))/sqrt(e))/e - 2*(9*a^3*e*sqrt(e/tan(d*x + c)) + a^3*(e/tan(d*
x + c))^(3/2))/e^3)*e/d
```

mupad [B] time = 0.62, size = 100, normalized size = 0.85

$$\frac{2\,\sqrt{2}\,a^{3}\,\mathrm{atanh}\left(\frac{32\,\sqrt{2}\,a^{6}\,\sqrt{e}\,\sqrt{e\cot(c+d\,x)}}{32\,a^{6}\,e+32\,a^{6}\,e\cot(c+d\,x)}\right)}{d\,\sqrt{e}}-\frac{2\,a^{3}\,{\left(e\cot\left(c+d\,x\right)\right)}^{3/2}}{3\,d\,e^{2}}-\frac{6\,a^{3}\,\sqrt{e\cot\left(c+d\,x\right)}}{d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^3/(e*cot(c + d*x))^(1/2),x)
```

```
[Out] (2*2^(1/2)*a^3*atanh((32*2^(1/2)*a^6*e^(1/2)*(e*cot(c + d*x))^(1/2))/(32*a^
6*e + 32*a^6*e*cot(c + d*x))))/(d*e^(1/2)) - (2*a^3*(e*cot(c + d*x))^(3/2))
/(3*d*e^2) - (6*a^3*(e*cot(c + d*x))^(1/2))/(d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int \frac{1}{\sqrt{e\cot(c+dx)}}\,dx+\int \frac{3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx+\int \frac{3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx+\int \frac{\cot^3(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**3/(e*cot(d*x+c))**(1/2),x)
```

```
[Out] a**3*(Integral(1/sqrt(e*cot(c + d*x)), x) + Integral(3*cot(c + d*x)/sqrt(e*
cot(c + d*x)), x) + Integral(3*cot(c + d*x)**2/sqrt(e*cot(c + d*x)), x) + I
ntegral(cot(c + d*x)**3/sqrt(e*cot(c + d*x)), x))
```

3.19 $\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=114

$$\frac{2\sqrt{2}\,a^3\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{3/2}}-\frac{4a^3\sqrt{e\cot(c+dx)}}{de^2}+\frac{2\left(a^3\cot(c+dx)+a^3\right)}{de\sqrt{e\cot(c+dx)}}$$

```
[Out] 2*a^3*arctan(1/2*(e^(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))
*2^(1/2)/d/e^(3/2)+2*(a^3+a^3*cot(d*x+c))/d/e/(e*cot(d*x+c))^(1/2)-4*a^3*(e
*cot(d*x+c))^(1/2)/d/e^2
```

Rubi [A] time = 0.18, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3565, 3630, 3532, 205}

$$-\frac{4a^3\sqrt{e\cot(c+dx)}}{de^2}+\frac{2\sqrt{2}\,a^3\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{3/2}}+\frac{2\left(a^3\cot(c+dx)+a^3\right)}{de\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (2*Sqrt[2]*a^3*ArcTan[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[
c + d*x]])])/(d*e^(3/2)) - (4*a^3*Sqrt[e*Cot[c + d*x]])/(d*e^2) + (2*(a^3 +
 a^3*Cot[c + d*x]))/(d*e*Sqrt[e*Cot[c + d*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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
```

```
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{3/2}}\,dx = \frac{2\left(a^3+a^3\cot(c+dx)\right)}{de\sqrt{e\cot(c+dx)}} - \frac{2\int \frac{-2a^3e^2-a^3e^2\cot(c+dx)-a^3e^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^3}$$

$$= -\frac{4a^3\sqrt{e\cot(c+dx)}}{de^2} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{de\sqrt{e\cot(c+dx)}} - \frac{2\int \frac{-a^3e^2-a^3e^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^3}$$

$$= -\frac{4a^3\sqrt{e\cot(c+dx)}}{de^2} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{de\sqrt{e\cot(c+dx)}} + \frac{\left(4a^6e\right)\mathrm{Subst}\left(\int \frac{1}{-2a^6e^4-ex^2}\,dx, x, \frac{-a^3}{\cdots}\right.}{d}$$

$$= \frac{2\sqrt{2}\,a^3\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{3/2}} - \frac{4a^3\sqrt{e\cot(c+dx)}}{de^2} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{de\sqrt{e\cot(c+dx)}}$$

Mathematica [C] time = 2.89, size = 311, normalized size = 2.73

$$\frac{a^3(\cot(c+dx)+1)^3\left(\sin(c+dx)\left(2\sin(2(c+dx))\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)-4\cos^2(c+dx)+\sqrt{2}\sin^2(c+d\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (a^3*(1 + Cot[c + d*x])^3*(-4*Cos[c + d*x]^3*Hypergeometric2F1[3/4, 1, 7/4,
 -Cot[c + d*x]^2] + Sin[c + d*x]*(-4*Cos[c + d*x]^2 + 2*Sqrt[2]*ArcTan[1 -
Sqrt[2]*Sqrt[Cot[c + d*x]]]*Cot[c + d*x]^(3/2)*Sin[c + d*x]^2 - 2*Sqrt[2]*A
rcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]*Cot[c + d*x]^(3/2)*Sin[c + d*x]^2 + S
qrt[2]*Cot[c + d*x]^(3/2)*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]
]*Sin[c + d*x]^2 - Sqrt[2]*Cot[c + d*x]^(3/2)*Log[1 + Sqrt[2]*Sqrt[Cot[c +
d*x]] + Cot[c + d*x]]*Sin[c + d*x]^2 + 2*Hypergeometric2F1[-1/4, 1, 3/4, -C
ot[c + d*x]^2]*Sin[2*(c + d*x)])))/(2*d*(e*Cot[c + d*x])^(3/2)*(Cos[c + d*x
] + Sin[c + d*x])^3)
```

fricas [A] time = 0.67, size = 372, normalized size = 3.26

$$\left[\frac{\sqrt{2}\left(a^{3}e\cos\left(2\,dx+2\,c\right)+a^{3}e\right)\sqrt{-\frac{1}{e}}\,\log\left(-\sqrt{2}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\sqrt{-\frac{1}{e}}\left(\cos\left(2\,dx+2\,c\right)+\sin\left(2\,dx+2\,c\right)-1\right)-2}{de^{2}\cos\left(2\,dx+2\,c\right)+de^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] [(sqrt(2)*(a^3*e*cos(2*d*x + 2*c) + a^3*e)*sqrt(-1/e)*log(-sqrt(2)*sqrt((e*
cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin(
2*d*x + 2*c) - 1) - 2*sin(2*d*x + 2*c) + 1) - 2*(a^3*cos(2*d*x + 2*c) - a^3
*sin(2*d*x + 2*c) + a^3)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(
d*e^2*cos(2*d*x + 2*c) + d*e^2), 2*(sqrt(2)*(a^3*e*cos(2*d*x + 2*c) + a^3*e
)*arctan(-1/2*sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(
2*d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(sqrt(e)*(cos(2*d*x + 2*c) + 1)))/sqrt
(e) - (a^3*cos(2*d*x + 2*c) - a^3*sin(2*d*x + 2*c) + a^3)*sqrt((e*cos(2*d*x
 + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e^2*cos(2*d*x + 2*c) + d*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a\cot\left(dx+c\right)+a\right)^{3}}{\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.48, size = 388, normalized size = 3.40

$$-\frac{2a^3\sqrt{e\cot(dx+c)}}{d\,e^2}-\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d\,e^2}-\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right.}{d\,e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^3/(e*cot(d*x+c))^(3/2),x)
```

```
[Out] -2*a^3*(e*cot(d*x+c))^(1/2)/d/e^2-1/2/d*a^3/e^2*(e^2)^(1/4)*2^(1/2)*ln((e*c
ot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+
c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^3/e^2*(e^2)
^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^3/e
^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-
1/2/d*a^3/e*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*
2^(1/2)+(e^2)^(1/2)))-1/d*a^3/e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^3/e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/d*a^3/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.68, size = 130, normalized size = 1.14

$$-\frac{2\left(\frac{a^3\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{e^2}-\frac{a^3}{e^2\sqrt{\frac{e}{\tan(dx+c)}}}+\frac{a^3\sqrt{\frac{e}{\tan(dx+c)}}}{e^3}\right)e}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2*(a^3*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c
)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqr
```

```
t(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/e^2 - a^3/(e^2*sqrt(e/tan(d*x + c))) +
 a^3*sqrt(e/tan(d*x + c))/e^3)*e/d
```

mupad [B] time = 0.58, size = 119, normalized size = 1.04

$$\frac{2\,a^3}{d\,e\,\sqrt{e\cot\left(c+d\,x\right)}}-\frac{2\,a^3\,\sqrt{e\cot\left(c+d\,x\right)}}{d\,e^2}-\frac{\sqrt{2}\,a^3\,\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}+\frac{\sqrt{2}\,(e\cot(c+}{2\,e^{3/2}}\right.\right.}{d\,e^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^3/(e*cot(c + d*x))^(3/2),x)
```

```
[Out] (2*a^3)/(d*e*(e*cot(c + d*x))^(1/2)) - (2*a^3*(e*cot(c + d*x))^(1/2))/(d*e^
2) - (2^(1/2)*a^3*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2))) + 2
*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c + d*
x))^(3/2))/(2*e^(3/2)))))/(d*e^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int\frac{1}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx+\int\frac{3\cot(c+dx)}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx+\int\frac{3\cot^2(c+dx)}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx+\int\frac{\cot^3(c+dx)}{(e\cot(c+dx))^{\frac{3}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**3/(e*cot(d*x+c))**(3/2),x)
```

```
[Out] a**3*(Integral((e*cot(c + d*x))**(-3/2), x) + Integral(3*cot(c + d*x)/(e*co
t(c + d*x))**(3/2), x) + Integral(3*cot(c + d*x)**2/(e*cot(c + d*x))**(3/2)
, x) + Integral(cot(c + d*x)**3/(e*cot(c + d*x))**(3/2), x))
```

3.20 $\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=117

$$-\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{5/2}}+\frac{16a^3}{3de^2\sqrt{e\cot(c+dx)}}+\frac{2\left(a^3\cot(c+dx)+a^3\right)}{3de(e\cot(c+dx))^{3/2}}$$

```
[Out] 2/3*(a^3+a^3*cot(d*x+c))/d/e/(e*cot(d*x+c))^(3/2)-2*a^3*arctanh(1/2*(e^(1/2
)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*2^(1/2)/d/e^(5/2)+16/3*
a^3/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3565, 3628, 3532, 208}

$$\frac{16a^3}{3de^2\sqrt{e\cot(c+dx)}}-\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}\,\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{5/2}}+\frac{2\left(a^3\cot(c+dx)+a^3\right)}{3de(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (-2*Sqrt[2]*a^3*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Co
t[c + d*x]])])/(d*e^(5/2)) + (16*a^3)/(3*d*e^2*Sqrt[e*Cot[c + d*x]]) + (2*(
a^3 + a^3*Cot[c + d*x]))/(3*d*e*(e*Cot[c + d*x])^(3/2))
```

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]
```

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
```

```
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3628

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*tan[(e_.) +
 (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2
- a*b*B + a^2*C)*(a + b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)*(a^2 + b^2)), x
] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])^(m + 1)*Simp[b*B + a*(A -
C) - (A*b - a*B - b*C)*Tan[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B,
 C}, x] && NeQ[A*b^2 - a*b*B + a^2*C, 0] && LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{5/2}}\,dx = \frac{2\left(a^3+a^3\cot(c+dx)\right)}{3de(e\cot(c+dx))^{3/2}} - \frac{2\int \frac{-4a^3e^2-3a^3e^2\cot(c+dx)-a^3e^2\cot^2(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{3e^3}$$

$$= \frac{16a^3}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{3de(e\cot(c+dx))^{3/2}} - \frac{2\int \frac{-3a^3e^3+3a^3e^3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{3e^5}$$

$$= \frac{16a^3}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{3de(e\cot(c+dx))^{3/2}} + \frac{\left(12a^6e\right)\text{Subst}\left(\int \frac{1}{18a^6e^6-ex^2}\,dx, x, \right.}{d}$$

$$= -\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{5/2}} + \frac{16a^3}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{3de(e\cot(c+dx))^{3/2}}$$

Mathematica [C] time = 6.11, size = 417, normalized size = 3.56

$$-\frac{2\cos^3(c+dx)\cot(c+dx)(a\cot(c+dx)+a)^3\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)}{3d(e\cot(c+dx))^{5/2}(\sin(c+dx)+\cos(c+dx))^3} + \frac{6\sin(c+dx)\cos^2(c+dx)(a\cot(c+}{d(e\cot(c+dx))^{5/2}(\mathrm{si}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (-2*Cos[c + d*x]^3*Cot[c + d*x]*(a + a*Cot[c + d*x])^3*Hypergeometric2F1[3/
4, 1, 7/4, -Cot[c + d*x]^2])/(3*d*(e*Cot[c + d*x])^(5/2)*(Cos[c + d*x] + Si
n[c + d*x])^3) + (6*Cos[c + d*x]^2*(a + a*Cot[c + d*x])^3*Hypergeometric2F1
[-1/4, 1, 3/4, -Cot[c + d*x]^2]*Sin[c + d*x])/(d*(e*Cot[c + d*x])^(5/2)*(Co
s[c + d*x] + Sin[c + d*x])^3) + (2*Cos[c + d*x]*(a + a*Cot[c + d*x])^3*Hype
rgeometric2F1[-3/4, 1, 1/4, -Cot[c + d*x]^2]*Sin[c + d*x]^2)/(3*d*(e*Cot[c
+ d*x])^(5/2)*(Cos[c + d*x] + Sin[c + d*x])^3) + (3*Cot[c + d*x]^(5/2)*(a +
 a*Cot[c + d*x])^3*(2*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqr
t[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]) + Sqrt[2]*Log[1 - Sqrt[2]*Sqrt
[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]
 + Cot[c + d*x]])*Sin[c + d*x]^3)/(4*d*(e*Cot[c + d*x])^(5/2)*(Cos[c + d*x]
 + Sin[c + d*x])^3)
```

fricas [A] time = 1.54, size = 378, normalized size = 3.23

$$\left[\frac{\frac{3\sqrt{2}\left(a^3e\cos(2dx+2c)+a^3e\right)\log\left(\frac{\sqrt{2}\sqrt{\frac{e\cos(2dx+2c)+e}{\sin(2dx+2c)}}(\cos(2dx+2c)-\sin(2dx+2c)-1)}{\sqrt{e}}+2\sin(2dx+2c)+1\right)}{\sqrt{e}} - 2\left(a^3\cos(2dx+2c) - 9a^3\sin(\right.}{3\left(de^3\cos(2dx+2c)+de^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*(3*sqrt(2)*(a^3*e*cos(2*d*x + 2*c) + a^3*e)*log(sqrt(2)*sqrt((e*cos(2*
d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) - 1)
/sqrt(e) + 2*sin(2*d*x + 2*c) + 1)/sqrt(e) - 2*(a^3*cos(2*d*x + 2*c) - 9*a^
3*sin(2*d*x + 2*c) - a^3)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/
(d*e^3*cos(2*d*x + 2*c) + d*e^3), 2/3*(3*sqrt(2)*(a^3*e*cos(2*d*x + 2*c) +
a^3*e)*sqrt(-1/e)*arctan(1/2*sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*
x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)/(cos(2*d*x +
 2*c) + 1)) - (a^3*cos(2*d*x + 2*c) - 9*a^3*sin(2*d*x + 2*c) - a^3)*sqrt((e
*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e^3*cos(2*d*x + 2*c) + d*e^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x, algorithm="giac")
```

[Out] integrate((a*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(5/2), x)

maple [B] time = 0.50, size = 388, normalized size = 3.32

$$-\frac{a^{3} \left(e^{2}\right)^{\frac{1}{4}} \sqrt{2}\, \ln \left(\frac{e \cot \left(d x +c \right)+\left(e^{2}\right)^{\frac{1}{4}} \sqrt{e \cot \left(d x +c \right)}\, \sqrt{2}+\sqrt{e^{2}}}{e \cot \left(d x +c \right)-\left(e^{2}\right)^{\frac{1}{4}} \sqrt{e \cot \left(d x +c \right)}\, \sqrt{2}+\sqrt{e^{2}}}\right)}{2 d \,e^{3}}-\frac{a^{3} \left(e^{2}\right)^{\frac{1}{4}} \sqrt{2}\, \arctan \left(\frac{\sqrt{2}\, \sqrt{e \cot \left(d x +c \right)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{d \,e^{3}}+\frac{a^{3} \left(e^{2}\right)^{\frac{1}{4}} \sqrt{2}\, \mathrm{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+cot(d*x+c)*a)^3/(e*cot(d*x+c))^(5/2),x)

[Out] -1/2/d*a^3/e^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^3/e^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a^3/e^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*a^3/e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d*a^3/e^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^3/e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/3/d*a^3/e/(e*cot(d*x+c))^(3/2)+6*a^3/d/e^2/(e*cot(d*x+c))^(1/2)

maxima [A] time = 0.79, size = 133, normalized size = 1.14

$$-\frac{e \left(\frac{3 a^{3} \left(\frac{\sqrt{2} \log\left(\sqrt{2} \sqrt{e} \sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2} \log\left(-\sqrt{2} \sqrt{e} \sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{e^{3}}-\frac{2 \left(a^{3} e+\frac{9 a^{3} e}{\tan(dx+c)}\right)}{e^{3} \left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}\right)}{3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x, algorithm="maxima")

[Out] -1/3*e*(3*a^3*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/e^3 - 2*(a^3*e + 9*a^3*e/tan(d*x + c))/(e^3*(e/tan(d*x + c))^(3/2)))/d

mupad [B] time = 0.71, size = 101, normalized size = 0.86

$$\frac{\frac{2 a^3 e}{3}+6 a^3 e \cot(c+d x)}{d e^2 (e \cot(c+d x))^{3/2}}-\frac{2 \sqrt{2}\, a^3 \operatorname{atanh}\left(\frac{32 \sqrt{2}\, a^6 d e^{5/2} \sqrt{e \cot(c+d x)}}{32 a^6 d e^3+32 a^6 d e^3 \cot(c+d x)}\right)}{d e^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^3/(e*cot(c + d*x))^(5/2),x)
```

```
[Out] ((2*a^3*e)/3 + 6*a^3*e*cot(c + d*x))/(d*e^2*(e*cot(c + d*x))^(3/2)) - (2*2^
(1/2)*a^3*atanh((32*2^(1/2)*a^6*d*e^(5/2)*(e*cot(c + d*x))^(1/2))/(32*a^6*d
*e^3 + 32*a^6*d*e^3*cot(c + d*x))))/(d*e^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int \frac{1}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx + \int \frac{3\cot(c+dx)}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx + \int \frac{3\cot^2(c+dx)}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx + \int \frac{\cot^3(c+dx)}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**3/(e*cot(d*x+c))**(5/2),x)
```

```
[Out] a**3*(Integral((e*cot(c + d*x))**(-5/2), x) + Integral(3*cot(c + d*x)/(e*co
t(c + d*x))**(5/2), x) + Integral(3*cot(c + d*x)**2/(e*cot(c + d*x))**(5/2)
, x) + Integral(cot(c + d*x)**3/(e*cot(c + d*x))**(5/2), x))
```

3.21 $\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=141

$$-\frac{2\sqrt{2}\,a^3\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{7/2}}+\frac{4a^3}{de^3\sqrt{e\cot(c+dx)}}+\frac{8a^3}{5de^2(e\cot(c+dx))^{3/2}}+\frac{2\left(a^3\cot(c+dx)+a^3\right)}{5de(e\cot(c+dx))^{5/2}}$$

```
[Out] 8/5*a^3/d/e^2/(e*cot(d*x+c))^(3/2)+2/5*(a^3+a^3*cot(d*x+c))/d/e/(e*cot(d*x+
c))^(5/2)-2*a^3*arctan(1/2*(e^(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+
c))^(1/2))*2^(1/2)/d/e^(7/2)+4*a^3/d/e^3/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3565, 3628, 3529, 3532, 205}

$$\frac{4a^3}{de^3\sqrt{e\cot(c+dx)}}+\frac{8a^3}{5de^2(e\cot(c+dx))^{3/2}}-\frac{2\sqrt{2}\,a^3\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{7/2}}+\frac{2\left(a^3\cot(c+dx)+a^3\right)}{5de(e\cot(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] (-2*Sqrt[2]*a^3*ArcTan[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot
[c + d*x]])])/(d*e^(7/2)) + (8*a^3)/(5*d*e^2*(e*Cot[c + d*x])^(3/2)) + (4*a
^3)/(d*e^3*Sqrt[e*Cot[c + d*x]]) + (2*(a^3 + a^3*Cot[c + d*x]))/(5*d*e*(e*C
ot[c + d*x])^(5/2))
```

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 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
```

```
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3628

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*tan[(e_.) +
 (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2
- a*b*B + a^2*C)*(a + b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)*(a^2 + b^2)), x
] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])^(m + 1)*Simp[b*B + a*(A -
C) - (A*b - a*B - b*C)*Tan[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B,
 C}, x] && NeQ[A*b^2 - a*b*B + a^2*C, 0] && LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{7/2}}\,dx = \frac{2\left(a^3+a^3\cot(c+dx)\right)}{5de(e\cot(c+dx))^{5/2}} - \frac{2\int \frac{-6a^3e^2-5a^3e^2\cot(c+dx)-a^3e^2\cot^2(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx}{5e^3}$$

$$= \frac{8a^3}{5de^2(e\cot(c+dx))^{3/2}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{5de(e\cot(c+dx))^{5/2}} - \frac{2\int \frac{-5a^3e^3+5a^3e^3\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{5e^5}$$

$$= \frac{8a^3}{5de^2(e\cot(c+dx))^{3/2}} + \frac{4a^3}{de^3\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{5de(e\cot(c+dx))^{5/2}} - \frac{2\int \frac{5a^3e^4+5a^3e}{\sqrt{e\cot}}}{5e}$$

$$= \frac{8a^3}{5de^2(e\cot(c+dx))^{3/2}} + \frac{4a^3}{de^3\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{5de(e\cot(c+dx))^{5/2}} + \frac{\left(20a^6e\right)\mathrm{Sub}}{}$$

$$= -\frac{2\sqrt{2}\,a^3\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{7/2}} + \frac{8a^3}{5de^2(e\cot(c+dx))^{3/2}} + \frac{4a^3}{de^3\sqrt{e\cot(c+dx)}} + \frac{2\left(a\right.}{5d}$$

Mathematica [C] time = 3.34, size = 269, normalized size = 1.91

$$\frac{a^3(\tan(c+dx)+1)^3\left(120\cos^3(c+dx)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)+\sin(c+dx)\left(40\cos^2(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] (a^3*(120*Cos[c + d*x]^3*Hypergeometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] +
 Sin[c + d*x]*(40*Cos[c + d*x]^2*Hypergeometric2F1[-3/4, 1, 1/4, -Cot[c + d
*x]^2] + Sin[c + d*x]*(8*Cos[c + d*x]*Hypergeometric2F1[-5/4, 1, -1/4, -Cot
[c + d*x]^2] + 5*Sqrt[2]*Cot[c + d*x]^(7/2)*(2*ArcTan[1 - Sqrt[2]*Sqrt[Cot[
c + d*x]]] - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + Log[1 - Sqrt[2]*Sqr
t[Cot[c + d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[
c + d*x]])*Sin[c + d*x])))*(1 + Tan[c + d*x])^3)/(20*d*e^3*Sqrt[e*Cot[c + d
*x]]*(Cos[c + d*x] + Sin[c + d*x])^3)
```

fricas [A] time = 0.45, size = 485, normalized size = 3.44

$$\left[\frac{5\sqrt{2}\left(a^3e\cos\left(2\,dx+2\,c\right)^2+2\,a^3e\cos\left(2\,dx+2\,c\right)+a^3e\right)\sqrt{-\frac{1}{e}}\,\log\left(\sqrt{2}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\sqrt{-\frac{1}{e}}\left(\cos\left(2\,dx+2\,c\right)+\right.\right.}{5\left(de^4\cos\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] [1/5*(5*sqrt(2)*(a^3*e*cos(2*d*x + 2*c)^2 + 2*a^3*e*cos(2*d*x + 2*c) + a^3*
e)*sqrt(-1/e)*log(sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*s
qrt(-1/e)*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) - 1) - 2*sin(2*d*x + 2*c) +
1) - 2*(5*a^3*cos(2*d*x + 2*c)^2 - 5*a^3 - (9*a^3*cos(2*d*x + 2*c) + 11*a^3
)*sin(2*d*x + 2*c))*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e^4
*cos(2*d*x + 2*c)^2 + 2*d*e^4*cos(2*d*x + 2*c) + d*e^4), -2/5*(5*sqrt(2)*(a
^3*e*cos(2*d*x + 2*c)^2 + 2*a^3*e*cos(2*d*x + 2*c) + a^3*e)*arctan(-1/2*sqr
t(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - si
n(2*d*x + 2*c) + 1)/(sqrt(e)*(cos(2*d*x + 2*c) + 1)))/sqrt(e) + (5*a^3*cos(
```

```
2*d*x + 2*c)^2 - 5*a^3 - (9*a^3*cos(2*d*x + 2*c) + 11*a^3)*sin(2*d*x + 2*c)
)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e^4*cos(2*d*x + 2*c)^
2 + 2*d*e^4*cos(2*d*x + 2*c) + d*e^4)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(7/2), x)
```

maple [B] time = 0.53, size = 409, normalized size = 2.90

$$\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d\,e^4}+\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d\,e^4}-\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^3/(e*cot(d*x+c))^(7/2),x)
```

```
[Out] 1/2/d*a^3/e^4*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2)))+1/d*a^3/e^4*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^3/e^4*(e^2)^(1/4)*2^(1/2)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*a^3/e^3*2^(1/2)/(e^2)^(1/4)*
ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*c
ot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d*a^3/e^
3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/
d*a^3/e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)+1)+2/5/d*a^3/e/(e*cot(d*x+c))^(5/2)+2*a^3/d/e^2/(e*cot(d*x+c))^(3/2)+4*
a^3/d/e^3/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.77, size = 148, normalized size = 1.05

$$\frac{2e\left(\frac{5a^3\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{e^4}+\frac{a^3e^2+\frac{5a^3e^2}{\tan(dx+c)}+\frac{10a^3e^2}{\tan(dx+c)^2}}{e^4\left(\frac{e}{\tan(dx+c)}\right)^{\frac{5}{2}}}\right)}{5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2/5*e*(5*a^3*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*
x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) -
2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/e^4 + (a^3*e^2 + 5*a^3*e^2/tan(d*
x + c) + 10*a^3*e^2/tan(d*x + c)^2)/(e^4*(e/tan(d*x + c))^(5/2)))/d
```

mupad [B] time = 1.26, size = 126, normalized size = 0.89

$$\frac{4\,e\,a^3\cot(c+d\,x)^2+2\,e\,a^3\cot(c+d\,x)+\frac{2\,e\,a^3}{5}}{d\,e^2\,(e\cot(c+d\,x))^{5/2}}+\frac{\sqrt{2}\,a^3\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}+\frac{\sqrt{2}\,(\cdots}{}\right)\right)}{d\,e^{7/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^3/(e*cot(c + d*x))^(7/2),x)
```

```
[Out] ((2*a^3*e)/5 + 4*a^3*e*cot(c + d*x)^2 + 2*a^3*e*cot(c + d*x))/(d*e^2*(e*cot
(c + d*x))^(5/2)) + (2^(1/2)*a^3*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(
2*e^(1/2))) + 2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2
)*(e*cot(c + d*x))^(3/2))/(2*e^(3/2)))))/(d*e^(7/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int\frac{1}{(e\cot(c+dx))^{\frac{7}{2}}}\,dx+\int\frac{3\cot(c+dx)}{(e\cot(c+dx))^{\frac{7}{2}}}\,dx+\int\frac{3\cot^2(c+dx)}{(e\cot(c+dx))^{\frac{7}{2}}}\,dx+\int\frac{\cot^3(c+dx)}{(e\cot(c+dx))^{\frac{7}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**3/(e*cot(d*x+c))**(7/2),x)
```

```
[Out] a**3*(Integral((e*cot(c + d*x))**(-7/2), x) + Integral(3*cot(c + d*x)/(e*co
t(c + d*x))**(7/2), x) + Integral(3*cot(c + d*x)**2/(e*cot(c + d*x))**(7/2)
, x) + Integral(cot(c + d*x)**3/(e*cot(c + d*x))**(7/2), x))
```

3.22 $\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=165

$$\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{9/2}}-\frac{4a^3}{de^4\sqrt{e\cot(c+dx)}}+\frac{4a^3}{3de^3(e\cot(c+dx))^{3/2}}+\frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}}+\frac{2\left(a^3\cot(\ldots\right.}{7de(e\,\mathrm{co}\ldots}$$

```
[Out] 32/35*a^3/d/e^2/(e*cot(d*x+c))^(5/2)+4/3*a^3/d/e^3/(e*cot(d*x+c))^(3/2)+2/7
*(a^3+a^3*cot(d*x+c))/d/e/(e*cot(d*x+c))^(7/2)+2*a^3*arctanh(1/2*(e^(1/2)+c
ot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*2^(1/2)/d/e^(9/2)-4*a^3/d/
e^4/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.30, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3565, 3628, 3529, 3532, 208}

$$-\frac{4a^3}{de^4\sqrt{e\cot(c+dx)}}+\frac{4a^3}{3de^3(e\cot(c+dx))^{3/2}}+\frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}}+\frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{de^{9/2}}+\frac{2\left(a^3\,\mathrm{co}\ldots\right.}{7de(e\,\mathrm{c}\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(9/2),x]
```

```
[Out] (2*Sqrt[2]*a^3*ArcTanh[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot
[c + d*x]])])/(d*e^(9/2)) + (32*a^3)/(35*d*e^2*(e*Cot[c + d*x])^(5/2)) + (4
*a^3)/(3*d*e^3*(e*Cot[c + d*x])^(3/2)) - (4*a^3)/(d*e^4*Sqrt[e*Cot[c + d*x]
]) + (2*(a^3 + a^3*Cot[c + d*x]))/(7*d*e*(e*Cot[c + d*x])^(7/2))
```

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]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3628

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*tan[(e_.) +
 (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2
- a*b*B + a^2*C)*(a + b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)*(a^2 + b^2)), x
] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])^(m + 1)*Simp[b*B + a*(A -
C) - (A*b - a*B - b*C)*Tan[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B,
 C}, x] && NeQ[A*b^2 - a*b*B + a^2*C, 0] && LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+a\cot(c+dx))^3}{(e\cot(c+dx))^{9/2}}\,dx = \frac{2\left(a^3+a^3\cot(c+dx)\right)}{7de(e\cot(c+dx))^{7/2}} - \frac{2\int \frac{-8a^3e^2-7a^3e^2\cot(c+dx)-a^3e^2\cot^2(c+dx)}{(e\cot(c+dx))^{7/2}}dx}{7e^3}$$

$$= \frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{7de(e\cot(c+dx))^{7/2}} - \frac{2\int \frac{-7a^3e^3+7a^3e^3\cot(c+dx)}{(e\cot(c+dx))^{5/2}}dx}{7e^5}$$

$$= \frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}} + \frac{4a^3}{3de^3(e\cot(c+dx))^{3/2}} + \frac{2\left(a^3+a^3\cot(c+dx)\right)}{7de(e\cot(c+dx))^{7/2}} - \frac{2\int \frac{7a^3}{}}{}$$

$$= \frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}} + \frac{4a^3}{3de^3(e\cot(c+dx))^{3/2}} - \frac{4a^3}{de^4\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\right.}{7de(e\cot(}$$

$$= \frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}} + \frac{4a^3}{3de^3(e\cot(c+dx))^{3/2}} - \frac{4a^3}{de^4\sqrt{e\cot(c+dx)}} + \frac{2\left(a^3+a^3\right.}{7de(e\cot(}$$

$$= \frac{2\sqrt{2}\,a^3\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{de^{9/2}} + \frac{32a^3}{35de^2(e\cot(c+dx))^{5/2}} + \frac{4a^3}{3de^3(e\cot(c+dx))^{3/2}}$$

Mathematica [C] time = 2.00, size = 174, normalized size = 1.05

$$\frac{2a^3\cos(c+dx)(\cot(c+dx)+1)^3\left(35\cos^2(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)+35\cos^2(c+dx)\cot(c+dx)\,{}_2F\right.}{35d(e\cot(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + a*Cot[c + d*x])^3/(e*Cot[c + d*x])^(9/2),x]
```

```
[Out] (2*a^3*Cos[c + d*x]*(1 + Cot[c + d*x])^3*(35*Cos[c + d*x]^2*Hypergeometric2
F1[-3/4, 1, 1/4, -Cot[c + d*x]^2] + 35*Cos[c + d*x]^2*Cot[c + d*x]*Hypergeo
metric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] + 5*Hypergeometric2F1[-7/4, 1, -3/
4, -Cot[c + d*x]^2]*Sin[c + d*x]^2 + (21*Hypergeometric2F1[-5/4, 1, -1/4, -
Cot[c + d*x]^2]*Sin[2*(c + d*x)])/2))/(35*d*(e*Cot[c + d*x])^(9/2)*(Cos[c +
 d*x] + Sin[c + d*x])^3)
```

fricas [A] time = 0.87, size = 514, normalized size = 3.12

$$\left[\frac{\frac{105\sqrt{2}\left(a^3e\cos(2dx+2c)^2+2a^3e\cos(2dx+2c)+a^3e\right)\log\left(-\frac{\sqrt{2}\sqrt{\frac{e\cos(2dx+2c)+e}{\sin(2dx+2c)}}(\cos(2dx+2c)-\sin(2dx+2c)-1)}{\sqrt{e}}+2\sin(2dx+2c)+1\right)}{\sqrt{e}}-2\left(55a^3\cos(\right.}{105\left(de^5\cos(2dx+2c)^2+2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x, algorithm="fricas")
```

```
[Out] [1/105*(105*sqrt(2)*(a^3*e*cos(2*d*x + 2*c)^2 + 2*a^3*e*cos(2*d*x + 2*c) +
a^3*e)*log(-sqrt(2)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*
d*x + 2*c) - sin(2*d*x + 2*c) - 1)/sqrt(e) + 2*sin(2*d*x + 2*c) + 1)/sqrt(e
) - 2*(55*a^3*cos(2*d*x + 2*c)^2 + 30*a^3*cos(2*d*x + 2*c) - 85*a^3 + 21*(1
3*a^3*cos(2*d*x + 2*c) + 7*a^3)*sin(2*d*x + 2*c))*sqrt((e*cos(2*d*x + 2*c)
+ e)/sin(2*d*x + 2*c)))/(d*e^5*cos(2*d*x + 2*c)^2 + 2*d*e^5*cos(2*d*x + 2*c
) + d*e^5), -2/105*(105*sqrt(2)*(a^3*e*cos(2*d*x + 2*c)^2 + 2*a^3*e*cos(2*d
*x + 2*c) + a^3*e)*sqrt(-1/e)*arctan(1/2*sqrt(2)*sqrt((e*cos(2*d*x + 2*c) +
 e)/sin(2*d*x + 2*c))*sqrt(-1/e)*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)/
(cos(2*d*x + 2*c) + 1)) + (55*a^3*cos(2*d*x + 2*c)^2 + 30*a^3*cos(2*d*x + 2
*c) - 85*a^3 + 21*(13*a^3*cos(2*d*x + 2*c) + 7*a^3)*sin(2*d*x + 2*c))*sqrt(
(e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(d*e^5*cos(2*d*x + 2*c)^2 + 2*d
*e^5*cos(2*d*x + 2*c) + d*e^5)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x, algorithm="giac")
```

```
[Out] integrate((a*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(9/2), x)
```

maple [B] time = 0.54, size = 430, normalized size = 2.61

$$\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{2d\,e^5}+\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{d\,e^5}-\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+cot(d*x+c)*a)^3/(e*cot(d*x+c))^(9/2),x)
```

```
[Out] 1/2/d*a^3/e^5*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2)))+1/d*a^3/e^5*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*a^3/e^5*(e^2)^(1/4)*2^(1/2)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*a^3/e^4*2^(1/2)/(e^2)^(1/4)*
ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*c
ot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a^3/e^
4*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/
d*a^3/e^4*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)+1)+2/7/d*a^3/e/(e*cot(d*x+c))^(7/2)+6/5*a^3/d/e^2/(e*cot(d*x+c))^(5/2)-
4*a^3/d/e^4/(e*cot(d*x+c))^(1/2)+4/3*a^3/d/e^3/(e*cot(d*x+c))^(3/2)
```

maxima [A] time = 0.85, size = 170, normalized size = 1.03

$$\frac{e\left(\frac{105\,a^{3}\left(\frac{\sqrt{2}\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{e^{5}}+\frac{2\left(15\,a^{3}e^{3}+\frac{63\,a^{3}e^{3}}{\tan(dx+c)}+\frac{70\,a^{3}e^{3}}{\tan(dx+c)^{2}}-\frac{210\,a^{3}e^{3}}{\tan(dx+c)^{3}}\right)}{e^{5}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{7}{2}}}\right)}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x, algorithm="maxima")
```

```
[Out] 1/105*e*(105*a^3*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/
tan(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) +
 e + e/tan(d*x + c))/sqrt(e))/e^5 + 2*(15*a^3*e^3 + 63*a^3*e^3/tan(d*x + c)
 + 70*a^3*e^3/tan(d*x + c)^2 - 210*a^3*e^3/tan(d*x + c)^3)/(e^5*(e/tan(d*x
+ c))^(7/2)))/d
```

mupad [B] time = 1.92, size = 129, normalized size = 0.78

$$\frac{-4\,e\,a^3\cot\left(c+d\,x\right)^3+\frac{4\,e\,a^3\cot(c+d\,x)^2}{3}+\frac{6\,e\,a^3\cot(c+d\,x)}{5}+\frac{2\,e\,a^3}{7}}{d\,e^2\,\left(e\cot\left(c+d\,x\right)\right)^{7/2}}+\frac{2\,\sqrt{2}\,a^3\,\mathrm{atanh}\left(\frac{32\,\sqrt{2}\,a^6\,d\,e^{9/2}\,\sqrt{e\cot(c+d\,x)}}{32\,a^6\,d\,e^5+32\,a^6\,d\,e^5\cot(c+d\,x)}\right)}{d\,e^{9/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*cot(c + d*x))^3/(e*cot(c + d*x))^(9/2),x)
```

```
[Out] ((2*a^3*e)/7 + (4*a^3*e*cot(c + d*x)^2)/3 - 4*a^3*e*cot(c + d*x)^3 + (6*a^3
*e*cot(c + d*x))/5)/(d*e^2*(e*cot(c + d*x))^(7/2)) + (2*2^(1/2)*a^3*atanh((
```

```
32*2^(1/2)*a^6*d*e^(9/2)*(e*cot(c + d*x))^(1/2))/(32*a^6*d*e^5 + 32*a^6*d*e
^5*cot(c + d*x))))/(d*e^(9/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$a^3\left(\int \frac{1}{(e\cot(c+dx))^{\frac{9}{2}}}\,dx + \int \frac{3\cot(c+dx)}{(e\cot(c+dx))^{\frac{9}{2}}}\,dx + \int \frac{3\cot^2(c+dx)}{(e\cot(c+dx))^{\frac{9}{2}}}\,dx + \int \frac{\cot^3(c+dx)}{(e\cot(c+dx))^{\frac{9}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+a*cot(d*x+c))**3/(e*cot(d*x+c))**(9/2),x)
```

```
[Out] a**3*(Integral((e*cot(c + d*x))**(-9/2), x) + Integral(3*cot(c + d*x)/(e*co
t(c + d*x))**(9/2), x) + Integral(3*cot(c + d*x)**2/(e*cot(c + d*x))**(9/2)
, x) + Integral(cot(c + d*x)**3/(e*cot(c + d*x))**(9/2), x))
```

3.23 $\int \frac{(e\cot(c+dx))^{5/2}}{a+a\cot(c+dx)}\,dx$

Optimal. Leaf size=111

$$\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad}-\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}-\frac{2e^2\sqrt{e\cot(c+dx)}}{ad}$$

```
[Out] e^(5/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d-1/2*e^(5/2)*arctan(1/2*(e^
(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a/d*2^(1/2)-2*e^2*(
e*cot(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.45, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {3566, 3653, 3532, 205, 3634, 63}

$$-\frac{2e^2\sqrt{e\cot(c+dx)}}{ad}+\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad}-\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)/(a + a*Cot[c + d*x]),x]
```

```
[Out] (e^(5/2)*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(a*d) - (e^(5/2)*ArcTan[(Sqr
t[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])])/(Sqrt[2]*a*d)
 - (2*e^2*Sqrt[e*Cot[c + d*x]])/(a*d)
```

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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
```

```
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{5/2}}{a+a\cot(c+dx)}\,dx = -\frac{2e^2\sqrt{e\cot(c+dx)}}{ad} - \frac{2\int \frac{\frac{ae^3}{2}+\frac{1}{2}ae^3\cot(c+dx)+\frac{1}{2}ae^3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}dx}{a}$$

$$= -\frac{2e^2\sqrt{e\cot(c+dx)}}{ad} - \frac{\int \frac{\frac{a^2e^3}{2}+\frac{1}{2}a^2e^3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}dx}{a^3} - \frac{1}{2}e^3\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+ }$$

$$= -\frac{2e^2\sqrt{e\cot(c+dx)}}{ad} - \frac{e^3\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}dx, x, -\cot(c+dx)\right)}{2d} + \frac{\left(ae^6\right)\mathrm{Subst}\left(\int \right.}{}$$

$$= -\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad} - \frac{2e^2\sqrt{e\cot(c+dx)}}{ad} + \frac{e^2\,\mathrm{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}dx, x, \sqrt{e\cot(c}\right.}{d}$$

$$= \frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad} - \frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad} - \frac{2e^2\sqrt{e\cot(c+dx)}}{ad}$$

Mathematica [A] time = 0.88, size = 110, normalized size = 0.99

$$-\frac{(e\cot(c+dx))^{5/2}\left(4\sqrt{\cot(c+dx)}+\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\cot(c+dx)}\right)-\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-2\,\mathrm{ta}\right.}{2ad\cot^{\frac{5}{2}}(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)/(a + a*Cot[c + d*x]),x]
```

```
[Out] -1/2*((Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 +
Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*ArcTan[Sqrt[Cot[c + d*x]]] + 4*Sqrt[Cot[c +
 d*x]])*(e*Cot[c + d*x])^(5/2))/(a*d*Cot[c + d*x]^(5/2))
```

fricas [A] time = 0.90, size = 400, normalized size = 3.60

$$\left[\frac{\sqrt{2}\sqrt{-e}\,e^2\log\left(\left(\sqrt{2}\cos(2\,dx+2\,c)+\sqrt{2}\sin(2\,dx+2\,c)-\sqrt{2}\right)\sqrt{-e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}-2\,e\sin(2\,dx+2\,c)+e\right.}{4\,ad}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/4*(sqrt(2)*sqrt(-e)*e^2*log((sqrt(2)*cos(2*d*x + 2*c) + sqrt(2)*sin(2*d*
x + 2*c) - sqrt(2))*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)
) - 2*e*sin(2*d*x + 2*c) + e) + 2*sqrt(-e)*e^2*log((e*cos(2*d*x + 2*c) - e*
sin(2*d*x + 2*c) + 2*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c
))*sin(2*d*x + 2*c) + e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)) - 8*e^2
*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(a*d), -1/2*(sqrt(2)*e^(5
/2)*arctan(-1/2*(sqrt(2)*cos(2*d*x + 2*c) - sqrt(2)*sin(2*d*x + 2*c) + sqrt
(2))*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/(e*cos(2*d*x +
 2*c) + e)) - 2*e^(5/2)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*
c))/sqrt(e)) + 4*e^2*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(a*d)
]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{5}{2}}}{a\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(5/2)/(a*cot(d*x + c) + a), x)
```

maple [B] time = 0.73, size = 394, normalized size = 3.55

$$-\frac{2e^{2}\sqrt{e\cot(dx+c)}}{da}+\frac{e^{\frac{5}{2}}\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{da}+\frac{e^{2}\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{8da}+\frac{e^{2}\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\ \mathrm{a}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)/(a+cot(d*x+c)*a),x)
```

```
[Out] -2*e^2*(e*cot(d*x+c))^(1/2)/d/a+e^(5/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2)
)/d/a+1/8/d/a*e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a*e^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d/a*e^2*(e^2)^(1/4)*2^(1/2)*arctan(
-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/8/d/a*e^3*2^(1/2)/(e^2)^(1/4
)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e
*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a*
e^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-
```

```
1/4/d/a*e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)+1)
```

maxima [A] time = 1.57, size = 134, normalized size = 1.21

$$\frac{\left(\frac{e^2\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{a}+\frac{2e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a}-\frac{4e\sqrt{\frac{e}{\tan(dx+c)}}}{a}\right)e}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*(e^2*(sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x +
c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sq
rt(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/a + 2*e^(3/2)*arctan(sqrt(e/tan(d*x +
 c))/sqrt(e))/a - 4*e*sqrt(e/tan(d*x + c))/a)*e/d
```

mupad [B] time = 0.68, size = 123, normalized size = 1.11

$$\frac{e^{5/2}\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{a\,d}-\frac{2\,e^2\,\sqrt{e\cot\left(c+d\,x\right)}}{a\,d}+\frac{\sqrt{2}\,e^{5/2}\,\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}+\frac{\sqrt{2}\,(e\cdots}{\cdots}\right.\right.}{4\,a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)/(a + a*cot(c + d*x)),x)
```

```
[Out] (e^(5/2)*atan((e*cot(c + d*x))^(1/2)/e^(1/2)))/(a*d) - (2*e^2*(e*cot(c + d*
x))^(1/2))/(a*d) + (2^(1/2)*e^(5/2)*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2)
)/(2*e^(1/2))) + 2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(
1/2)*(e*cot(c + d*x))^(3/2))/(2*e^(3/2)))))/(4*a*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\cot(c+dx))^{\frac{5}{2}}}{\cot(c+dx)+1}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)/(a+a*cot(d*x+c)),x)
```

```
[Out] Integral((e*cot(c + d*x))**(5/2)/(cot(c + d*x) + 1), x)/a
```

3.24 $\int \frac{(e\cot(c+dx))^{3/2}}{a+a\cot(c+dx)}\,dx$

Optimal. Leaf size=87

$$\frac{e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}-\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad}$$

```
[Out] -e^(3/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d+1/2*e^(3/2)*arctanh(1/2*(
e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a/d*2^(1/2)
```

Rubi [A] time = 0.24, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {3573, 3532, 208, 3634, 63, 205}

$$\frac{e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}-\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)/(a + a*Cot[c + d*x]),x]
```

```
[Out] -((e^(3/2)*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(a*d)) + (e^(3/2)*ArcTanh[
(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])])/(Sqrt[2]*
a*d)
```

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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3573

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(3/2)/((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[Simp[a^2*c - b^2*c + 2
*a*b*d + (2*a*b*c - a^2*d + b^2*d)*Tan[e + f*x], x]/Sqrt[a + b*Tan[e + f*x]
], x], x] + Dist[(b*c - a*d)^2/(c^2 + d^2), Int[(1 + Tan[e + f*x]^2)/(Sqrt[
a + b*Tan[e + f*x]]*(c + d*Tan[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e,
f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{3/2}}{a+a\cot(c+dx)}\,dx = \frac{\int \frac{-ae^2+ae^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2}+\frac{1}{2}e^2\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx$$

$$= \frac{e^2\,\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx,x,-\cot(c+dx)\right)}{2d}-\frac{e^4\,\text{Subst}\left(\int \frac{1}{2a^2e^4-ex^2}\,dx,x,\frac{-ae^2-ae^2\cot(c+dx}{\sqrt{e\cot(c+dx)}}\right.}{d}$$

$$= \frac{e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}-\frac{e\,\text{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx,x,\sqrt{e\cot(c+dx)}\right)}{d}$$

$$= -\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad}+\frac{e^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}$$

Mathematica [A] time = 4.05, size = 107, normalized size = 1.23

$$-\frac{(e\cot(c+dx))^{3/2}\left(\sqrt{2}\left(\log\left(-\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}-1\right)-\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+1\right)\right)\right.}{4ad\cot^{\frac{3}{2}}(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)/(a + a*Cot[c + d*x]),x]
```

```
[Out] -1/4*((e*Cot[c + d*x])^(3/2)*(4*ArcTan[Sqrt[Cot[c + d*x]]] + Sqrt[2]*(Log[-
1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c
 + d*x]] + Cot[c + d*x]])))/(a*d*Cot[c + d*x]^(3/2))
```

fricas [A] time = 0.79, size = 333, normalized size = 3.83

$$\left[-\frac{\sqrt{2}\,\sqrt{-e}\,e\arctan\left(\frac{\left(\sqrt{2}\,\cos(2\,dx+2\,c)+\sqrt{2}\,\sin(2\,dx+2\,c)+\sqrt{2}\right)\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}}{2\,(e\cos(2\,dx+2\,c)+e)}\right)-\sqrt{-e}\,e\log\left(\frac{e\cos(2\,dx+2\,c)-e\sin(2\,dx+2\,c)-2\,\cdots}{\cos(2\,dx+2\,c)\cdots}\right.}{2\,ad}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/2*(sqrt(2)*sqrt(-e)*e*arctan(1/2*(sqrt(2)*cos(2*d*x + 2*c) + sqrt(2)*si
n(2*d*x + 2*c) + sqrt(2))*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x
+ 2*c))/(e*cos(2*d*x + 2*c) + e)) - sqrt(-e)*e*log((e*cos(2*d*x + 2*c) - e*
sin(2*d*x + 2*c) - 2*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c
))*sin(2*d*x + 2*c) + e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)))/(a*d),
 1/4*(sqrt(2)*e^(3/2)*log(-(sqrt(2)*cos(2*d*x + 2*c) - sqrt(2)*sin(2*d*x +
2*c) - sqrt(2))*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)) + 2
*e*sin(2*d*x + 2*c) + e) - 4*e^(3/2)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/s
in(2*d*x + 2*c))/sqrt(e)))/(a*d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{3}{2}}}{a\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(3/2)/(a*cot(d*x + c) + a), x)
```

maple [B] time = 0.73, size = 368, normalized size = 4.23

$$-\frac{e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{da}+\frac{e\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{8da}+\frac{e\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+\right.}{4da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)/(a+cot(d*x+c)*a),x)
```

```
[Out] -e^(3/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/d/a+1/8/d/a*e*(e^2)^(1/4)*2^(
1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d
/a*e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
-1/4/d/a*e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)-1/8/d/a*e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/4/d/a*e^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2
)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/a*e^2*2^(1/2)/(e^2)^(1/4)*arcta
n(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.70, size = 118, normalized size = 1.36

$$\frac{e\left(\frac{e\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{a}-\frac{4\sqrt{e}\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a}\right)}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*e*(e*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x
 + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/t
an(d*x + c))/sqrt(e))/a - 4*sqrt(e)*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/a)
/d
```

mupad [B] time = 0.49, size = 79, normalized size = 0.91

$$\frac{\sqrt{2}\,e^{3/2}\,\mathrm{atanh}\left(\frac{12\sqrt{2}\,e^{25/2}\sqrt{e\cot(c+d\,x)}}{12\,e^{13}\cot(c+d\,x)+12\,e^{13}}\right)}{2\,a\,d}-\frac{e^{3/2}\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)/(a + a*cot(c + d*x)),x)
```

```
[Out] (2^(1/2)*e^(3/2)*atanh((12*2^(1/2)*e^(25/2)*(e*cot(c + d*x))^(1/2))/(12*e^1
3*cot(c + d*x) + 12*e^13)))/(2*a*d) - (e^(3/2)*atan((e*cot(c + d*x))^(1/2)/
e^(1/2)))/(a*d)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\cot(c+dx))^{\frac{3}{2}}}{\cot(c+dx)+1}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)/(a+a*cot(d*x+c)),x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)/(cot(c + d*x) + 1), x)/a
```

3.25 $\int \frac{\sqrt{e \cot(c+dx)}}{a+a \cot(c+dx)}\,dx$

Optimal. Leaf size=87

$$\frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e \cot(c+dx)}}{\sqrt{e}}\right)}{ad}+\frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e \cot(c+dx)}}\right)}{\sqrt{2}\,ad}$$

```
[Out] arctan((e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/a/d+1/2*arctan(1/2*(e^(1/2)-co
t(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*e^(1/2)/a/d*2^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3572, 3532, 205, 3634, 63}

$$\frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e \cot(c+dx)}}{\sqrt{e}}\right)}{ad}+\frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e \cot(c+dx)}}\right)}{\sqrt{2}\,ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]/(a + a*Cot[c + d*x]),x]
```

```
[Out] (Sqrt[e]*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(a*d) + (Sqrt[e]*ArcTan[(Sqr
t[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])])/(Sqrt[2]*a*d)
```

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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3572

```
Int[Sqrt[(a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[Simp[a*c + b*d + (b*c -
a*d)*Tan[e + f*x], x]/Sqrt[a + b*Tan[e + f*x]], x], x] - Dist[(d*(b*c - a*d
))/(c^2 + d^2), Int[(1 + Tan[e + f*x]^2)/(Sqrt[a + b*Tan[e + f*x]]*(c + d*T
an[e + f*x])), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{e\cot(c+dx)}}{a+a\cot(c+dx)}\,dx &= \frac{\int \frac{ae+ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2} - \frac{1}{2}e\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx \\
&= -\frac{e\,\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -\cot(c+dx)\right)}{2d} - \frac{e^2\,\text{Subst}\left(\int \frac{1}{-2a^2e^2-ex^2}\,dx, x, \frac{ae-ae\cot(c+dx}{\sqrt{e\cot(c+dx)}}\right.}{d} \\
&= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad} + \frac{\text{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d} \\
&= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad} + \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\,\cot(c+dx)}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad}
\end{aligned}$$

Mathematica [A] time = 0.25, size = 98, normalized size = 1.13

$$\frac{\sqrt{e\cot(c+dx)}\left(\sqrt{2}\,\tan^{-1}\left(1-\sqrt{2}\,\sqrt{\cot(c+dx)}\right)-\sqrt{2}\,\tan^{-1}\left(\sqrt{2}\,\sqrt{\cot(c+dx)}+1\right)+2\tan^{-1}\left(\sqrt{\cot(c+dx)}\right)\right)}{2ad\sqrt{\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]/(a + a*Cot[c + d*x]),x]
```

```
[Out] ((Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[
2]*Sqrt[Cot[c + d*x]]] + 2*ArcTan[Sqrt[Cot[c + d*x]]])*Sqrt[e*Cot[c + d*x]]
)/(2*a*d*Sqrt[Cot[c + d*x]])
```

fricas [A] time = 0.84, size = 331, normalized size = 3.80

$$\left[\frac{\sqrt{2}\sqrt{-e}\log\left(-\left(\sqrt{2}\cos\left(2\,dx+2\,c\right)+\sqrt{2}\sin\left(2\,dx+2\,c\right)-\sqrt{2}\right)\sqrt{-e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}-2\,e\sin\left(2\,dx+2\,c\right)+e\right)}{4\,ad}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/4*(sqrt(2)*sqrt(-e)*log(-(sqrt(2)*cos(2*d*x + 2*c) + sqrt(2)*sin(2*d*x +
 2*c) - sqrt(2))*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)) -
 2*e*sin(2*d*x + 2*c) + e) + 2*sqrt(-e)*log((e*cos(2*d*x + 2*c) - e*sin(2*d
*x + 2*c) + 2*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(
2*d*x + 2*c) + e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)))/(a*d), 1/2*(s
qrt(2)*sqrt(e)*arctan(-1/2*(sqrt(2)*cos(2*d*x + 2*c) - sqrt(2)*sin(2*d*x +
2*c) + sqrt(2))*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/(e*
cos(2*d*x + 2*c) + e)) + 2*sqrt(e)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin
(2*d*x + 2*c))/sqrt(e)))/(a*d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cot\left(dx+c\right)}}{a\cot\left(dx+c\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cot(d*x + c))/(a*cot(d*x + c) + a), x)
```

maple [B] time = 0.81, size = 358, normalized size = 4.11

$$\frac{\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)\sqrt{e}}{da}-\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{8da}-\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{4da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)/(a+cot(d*x+c)*a),x)
```

```
[Out] arctan((e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/d/a-1/8/d/a*(e^2)^(1/4)*2^(1/2
)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e
*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/4/d/a*
(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/
d/a*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
-1/8/d/a*e*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2)))-1/4/d/a*e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/a*e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.81, size = 113, normalized size = 1.30

$$-\frac{e\left(\frac{\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}}{a}-\frac{2\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a\sqrt{e}}\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/2*e*((sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c
)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqr
t(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/a - 2*arctan(sqrt(e/tan(d*x + c))/sqrt
(e))/(a*sqrt(e)))/d
```

mupad [B] time = 0.37, size = 102, normalized size = 1.17

$$\frac{\sqrt{e}\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{a\,d}-\frac{\sqrt{2}\,\sqrt{e}\,\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}+\frac{\sqrt{2}\,(e\cot(c+d\,x))^{3/2}}{2\,e^{3/2}}\right)\right)}{4\,a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)/(a + a*cot(c + d*x)),x)
```

```
[Out] (e^(1/2)*atan((e*cot(c + d*x))^(1/2)/e^(1/2)))/(a*d) - (2^(1/2)*e^(1/2)*(2*
atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2))) + 2*atan((2^(1/2)*(e*cot
(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c + d*x))^(3/2))/(2*e^(3/2)
))))/(4*a*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{e\cot(c+dx)}}{\cot(c+dx)+1}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)/(a+a*cot(d*x+c)),x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))/(cot(c + d*x) + 1), x)/a
```

3.26 $\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx$

Optimal. Leaf size=83

$$-\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad\sqrt{e}}-\frac{\tanh^{-1}\left(\frac{\sqrt{e}(\cot(c+dx)+1)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}ad\sqrt{e}}$$

```
[Out] -arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d/e^(1/2)-1/2*arctanh(1/2*(1+cot(d*
x+c))*e^(1/2)*2^(1/2)/(e*cot(d*x+c))^(1/2))/a/d*2^(1/2)/e^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {3574, 3532, 208, 3634, 63, 205}

$$-\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad\sqrt{e}}-\frac{\tanh^{-1}\left(\frac{\sqrt{e}(\cot(c+dx)+1)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}ad\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])),x]
```

```
[Out] -(ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]]/(a*d*Sqrt[e])) - ArcTanh[(Sqrt[e]*(1
 + Cot[c + d*x]))/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])]/(Sqrt[2]*a*d*Sqrt[e])
```

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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3574

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)/((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[(a + b*Tan[e + f*x])^m*
(c - d*Tan[e + f*x]), x], x] + Dist[d^2/(c^2 + d^2), Int[((a + b*Tan[e + f*
x])^m*(1 + Tan[e + f*x]^2))/(c + d*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2
, 0] &&  !IntegerQ[m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rubi steps

$$
\begin{aligned}
\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx &= \frac{1}{2}\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx + \frac{\int \frac{a-a\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2} \\
&= \frac{\operatorname{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -\cot(c+dx)\right)}{2d} - \frac{\operatorname{Subst}\left(\int \frac{1}{2a^2-ex^2}\,dx, x, \frac{a+a\,c\cdots}{\sqrt{e\,c\cdots}}\right.}{d} \\
&= -\frac{\tanh^{-1}\left(\frac{\sqrt{e}\,(1+\cot(c+dx))}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad\sqrt{e}} - \frac{\operatorname{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{de} \\
&= -\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ad\sqrt{e}} - \frac{\tanh^{-1}\left(\frac{\sqrt{e}\,(1+\cot(c+dx))}{\sqrt{2}\,\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ad\sqrt{e}}
\end{aligned}
$$

Mathematica [A] time = 0.52, size = 107, normalized size = 1.29

$$
-\frac{\sqrt{\cot(c+dx)}\left(\sqrt{2}\left(\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-\log\left(-\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}-1\right)\right)+4\cdots\right.}{4ad\sqrt{e\cot(c+dx)}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])),x]
```

```
[Out] -1/4*(Sqrt[Cot[c + d*x]]*(4*ArcTan[Sqrt[Cot[c + d*x]]] + Sqrt[2]*(-Log[-1 +
 Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] + Log[1 + Sqrt[2]*Sqrt[Cot[c +
d*x]] + Cot[c + d*x]])))/(a*d*Sqrt[e*Cot[c + d*x]])
```

fricas [A] time = 0.62, size = 321, normalized size = 3.87

$$\left[\frac{\sqrt{2}\sqrt{-e}\arctan\left(\frac{\sqrt{2}\sqrt{-e}\sqrt{\frac{e\cos(2dx+2c)+e}{\sin(2dx+2c)}}(\cos(2dx+2c)+\sin(2dx+2c)+1)}{2(e\cos(2dx+2c)+e)}\right)-\sqrt{-e}\log\left(\frac{e\cos(2dx+2c)-e\sin(2dx+2c)+2\sqrt{-e}\sqrt{\frac{e\cos(}{\sin}}}{\cos(2dx+2c)+\sin(2dx+2}\right.}{2ade}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [1/2*(sqrt(2)*sqrt(-e)*arctan(1/2*sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c)
 + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)/(e*cos(2*
d*x + 2*c) + e)) - sqrt(-e)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) +
2*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c)
 + e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)))/(a*d*e), 1/4*(sqrt(2)*sqr
t(e)*log(sqrt(2)*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(c
os(2*d*x + 2*c) - sin(2*d*x + 2*c) - 1) + 2*e*sin(2*d*x + 2*c) + e) - 4*sqr
t(e)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)))/(a*d*
e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a\cot(dx+c)+a)\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)*sqrt(e*cot(d*x + c))), x)
```

maple [B] time = 0.88, size = 365, normalized size = 4.40

$$-\frac{\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{ad\sqrt{e}}-\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{8dae}-\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{4dae}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(1/2)/(a+cot(d*x+c)*a),x)
```

```
[Out] -arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d/e^(1/2)-1/8/d/a/e*(e^2)^(1/4)*2^(
1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/4/d
/a/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
+1/4/d/a/e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)+1/8/d/a*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x
+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^
(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d/a*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.63, size = 120, normalized size = 1.45

$$-\frac{e\left(\frac{\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}}{ae}+\frac{4\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{ae^{\frac{3}{2}}}\right)}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/4*e*((sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x +
 c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/ta
n(d*x + c))/sqrt(e))/(a*e) + 4*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/(a*e^(3
/2)))/d
```

mupad [B] time = 0.52, size = 79, normalized size = 0.95

$$-\frac{\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{a\,d\,\sqrt{e}}-\frac{\sqrt{2}\,\mathrm{atanh}\left(\frac{12\,\sqrt{2}\,e^{9/2}\,\sqrt{e\cot(c+d\,x)}}{12\,e^5\cot(c+d\,x)+12\,e^5}\right)}{2\,a\,d\,\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(1/2)*(a + a*cot(c + d*x))),x)
```

```
[Out] - atan((e*cot(c + d*x))^(1/2)/e^(1/2))/(a*d*e^(1/2)) - (2^(1/2)*atanh((12*2
^(1/2)*e^(9/2)*(e*cot(c + d*x))^(1/2))/(12*e^5*cot(c + d*x) + 12*e^5)))/(2*
a*d*e^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{\sqrt{e\cot(c+dx)}\cot(c+dx)+\sqrt{e\cot(c+dx)}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(1/2)/(a+a*cot(d*x+c)),x)
[Out] Integral(1/(sqrt(e*cot(c + d*x))*cot(c + d*x) + sqrt(e*cot(c + d*x))), x)/a
```

3.27 $\int \frac{1}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))}\,dx$

Optimal. Leaf size=111

$$\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ade^{3/2}}-\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{3/2}}+\frac{2}{ade\sqrt{e\cot(c+dx)}}$$

```
[Out] arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d/e^(3/2)-1/2*arctan(1/2*(e^(1/2)-co
t(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a/d/e^(3/2)*2^(1/2)+2/a/d/e
/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.45, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.240, Rules used = {3569, 3653, 3532, 205, 3634, 63}

$$\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ade^{3/2}}-\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{3/2}}+\frac{2}{ade\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])),x]
```

```
[Out] ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]]/(a*d*e^(3/2)) - ArcTan[(Sqrt[e] - Sqrt
[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])]/(Sqrt[2]*a*d*e^(3/2)) + 2
/(a*d*e*Sqrt[e*Cot[c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
```

```
d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))}\,dx = \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{2\int \frac{-\frac{ae^2}{2}-\frac{1}{2}ae^2\cot(c+dx)-\frac{1}{2}ae^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{ae^3}$$

$$= \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{\int \frac{-\frac{1}{2}a^2e^2-\frac{1}{2}a^2e^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{a^3e^3} - \frac{\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot}}{2e}$$

$$= \frac{2}{ade\sqrt{e\cot(c+dx)}} - \frac{\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -\cot(c+dx)\right)}{2de} - \frac{(ae)}{}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{3/2}} + \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{\text{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx,\right.}{de}$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ade^{3/2}} - \frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{3/2}} + \frac{2}{ade\sqrt{e\cot(c+dx)}}$$

Mathematica [A] time = 2.03, size = 176, normalized size = 1.59

$$\frac{2\sin^4(c+dx)\left(\cot^4(c+dx)+2\cot^2(c+dx)-\sqrt{2}\cot^{\frac{5}{2}}(c+dx)\csc^2(2(c+dx))\tan^{-1}\left(1-\sqrt{2}\sqrt{\cot(c+dx)}\right)+\sqrt{}\right.}{ade\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])),x]
```

```
[Out] (2*(1 + 2*Cot[c + d*x]^2 + Cot[c + d*x]^4 - Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt
[Cot[c + d*x]]]*Cot[c + d*x]^(5/2)*Csc[2*(c + d*x)]^2 + Sqrt[2]*ArcTan[1 +
Sqrt[2]*Sqrt[Cot[c + d*x]]]*Cot[c + d*x]^(5/2)*Csc[2*(c + d*x)]^2 + 2*ArcTa
n[Sqrt[Cot[c + d*x]]]*Cot[c + d*x]^(5/2)*Csc[2*(c + d*x)]^2)*Sin[c + d*x]^4
)/(a*d*e*Sqrt[e*Cot[c + d*x]])
```

fricas [B] time = 1.13, size = 472, normalized size = 4.25

$$\left[-\frac{\sqrt{2}\sqrt{-e}\,(\cos(2\,dx+2\,c)+1)\log\left(-\sqrt{2}\sqrt{-e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos(2\,dx+2\,c)+\sin(2\,dx+2\,c)-1)-2\,e\sin(2\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/4*(sqrt(2)*sqrt(-e)*(cos(2*d*x + 2*c) + 1)*log(-sqrt(2)*sqrt(-e)*sqrt((
e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2
*c) - 1) - 2*e*sin(2*d*x + 2*c) + e) + 2*sqrt(-e)*(cos(2*d*x + 2*c) + 1)*lo
g((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) - 2*sqrt(-e)*sqrt((e*cos(2*d*x +
 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) + e)/(cos(2*d*x + 2*c) + sin(
2*d*x + 2*c) + 1)) - 8*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(
2*d*x + 2*c))/(a*d*e^2*cos(2*d*x + 2*c) + a*d*e^2), -1/2*(sqrt(2)*sqrt(e)*(
cos(2*d*x + 2*c) + 1)*arctan(-1/2*sqrt(2)*sqrt(e)*sqrt((e*cos(2*d*x + 2*c)
+ e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(e*cos(2*d
*x + 2*c) + e)) - 2*sqrt(e)*(cos(2*d*x + 2*c) + 1)*arctan(sqrt((e*cos(2*d*x
 + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)) - 4*sqrt((e*cos(2*d*x + 2*c) + e)/s
in(2*d*x + 2*c))*sin(2*d*x + 2*c))/(a*d*e^2*cos(2*d*x + 2*c) + a*d*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a\cot(dx+c)+a)\,(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)*(e*cot(d*x + c))^(3/2)), x)
```

maple [B] time = 0.81, size = 394, normalized size = 3.55

$$\frac{\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{ad\,e^{\frac{3}{2}}}+\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{8da\,e^{2}}+\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{4da\,e^{2}}-\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(3/2)/(a+cot(d*x+c)*a),x)
```

```
[Out] arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d/e^(3/2)+1/8/d/a/e^2*(e^2)^(1/4)*2^
(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
)/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/
d/a/e^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
+1)-1/4/d/a/e^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)+1)+1/8/d/a/e*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*
```

```
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x
+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a/e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d/a/e*2^(1/2)/(e^2)^(1/4)*arctan
(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/a/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 1.64, size = 136, normalized size = 1.23

$$\frac{e\left(\frac{\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}}{ae^{2}}+\frac{2\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{ae^{\frac{5}{2}}}+\frac{4}{ae^{2}\sqrt{\frac{e}{\tan(dx+c)}}}\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*e*((sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)
))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt
(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/(a*e^2) + 2*arctan(sqrt(e/tan(d*x + c))
/sqrt(e))/(a*e^(5/2)) + 4/(a*e^2*sqrt(e/tan(d*x + c))))/d
```

mupad [B] time = 0.64, size = 123, normalized size = 1.11

$$\frac{2}{a\,d\,e\,\sqrt{e\cot\left(c+d\,x\right)}}+\frac{\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{a\,d\,e^{3/2}}+\frac{\sqrt{2}\,\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}+\frac{\sqrt{2}\,{(e\cot(c+d\,x))}^{3}}{2\,e^{3/2}}\right.\right.}{4\,a\,d\,e^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(3/2)*(a + a*cot(c + d*x))),x)
```

```
[Out] 2/(a*d*e*(e*cot(c + d*x))^(1/2)) + atan((e*cot(c + d*x))^(1/2)/e^(1/2))/(a*
d*e^(3/2)) + (2^(1/2)*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)))
 + 2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c
+ d*x))^(3/2))/(2*e^(3/2)))))/(4*a*d*e^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\cot\left(c+dx\right)+\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(3/2)/(a+a*cot(d*x+c)),x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(3/2)*cot(c + d*x) + (e*cot(c + d*x))**(3/2))
, x)/a
```

3.28 $\int \frac{1}{(e\cot(c+dx))^{5/2}(a+a\cot(c+dx))}\,dx$

Optimal. Leaf size=135

$$-\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ade^{5/2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{5/2}}-\frac{2}{ade^2\sqrt{e\cot(c+dx)}}+\frac{2}{3ade(e\cot(c+dx))^{3/2}}$$

```
[Out] -arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d/e^(5/2)+2/3/a/d/e/(e*cot(d*x+c))^
(3/2)+1/2*arctanh(1/2*(e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(
1/2))/a/d/e^(5/2)*2^(1/2)-2/a/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.54, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {3569, 3649, 12, 16, 3573, 3532, 208, 3634, 63, 205}

$$-\frac{2}{ade^2\sqrt{e\cot(c+dx)}}-\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ade^{5/2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{5/2}}+\frac{2}{3ade(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])),x]
```

```
[Out] -(ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]]/(a*d*e^(5/2))) + ArcTanh[(Sqrt[e] +
Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])]/(Sqrt[2]*a*d*e^(5/2))
 + 2/(3*a*d*e*(e*Cot[c + d*x])^(3/2)) - 2/(a*d*e^2*Sqrt[e*Cot[c + d*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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3573

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(3/2)/((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[Simp[a^2*c - b^2*c + 2
*a*b*d + (2*a*b*c - a^2*d + b^2*d)*Tan[e + f*x], x]/Sqrt[a + b*Tan[e + f*x]
], x], x] + Dist[(b*c - a*d)^2/(c^2 + d^2), Int[(1 + Tan[e + f*x]^2)/(Sqrt[
a + b*Tan[e + f*x]]*(c + d*Tan[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e,
f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{5/2}(a+a\cot(c+dx))}\,dx = \frac{2}{3ade(e\cot(c+dx))^{3/2}} + \frac{2\int \frac{-\frac{3ae^2}{2}-\frac{3}{2}ae^2\cot(c+dx)-\frac{3}{2}ae^2\cot^2(c+dx)}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))}\,dx}{3ae^3}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2}{ade^2\sqrt{e\cot(c+dx)}} + \frac{4\int \frac{3a^2e^4\cot^2(c+dx}{4\sqrt{e\cot(c+dx)}\,(a+a\cot}}{3a^2e^6}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2}{ade^2\sqrt{e\cot(c+dx)}} + \frac{\int \frac{\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+}}{e^2}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2}{ade^2\sqrt{e\cot(c+dx)}} + \frac{\int \frac{(e\cot(c+dx))^{3/2}}{a+a\cot(c+dx)}\,dx}{e^4}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2}{ade^2\sqrt{e\cot(c+dx)}} + \frac{\int \frac{-ae^2+ae^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2e^4}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2}{ade^2\sqrt{e\cot(c+dx)}} - \frac{\text{Subst}\left(\int \frac{1}{2a^2e^4-ex^2}\,dx,\right.}{d}$$

$$= \frac{\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{5/2}} + \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2}{ade^2\sqrt{e\cot(c+a}}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{ade^{5/2}} + \frac{\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{\sqrt{2}\,ade^{5/2}} + \frac{2}{3ade(e\cot(c+dx}$$

Mathematica [A] time = 1.33, size = 131, normalized size = 0.97

$$\frac{8(\tan(c+dx)-3)-3\sqrt{2}\sqrt{\cot(c+dx)}\left(\log\left(-\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}-1\right)-\log\left(\cot(c+dx)+\sqrt{2}\sqrt{c\cdots}\right.\right.}{12ade^2\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])),x]
```

```
[Out] (-12*ArcTan[Sqrt[Cot[c + d*x]]]*Sqrt[Cot[c + d*x]] - 3*Sqrt[2]*Sqrt[Cot[c +
 d*x]]*(Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] - Log[1 + Sqrt[
2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]) + 8*(-3 + Tan[c + d*x]))/(12*a*d*e^2
*Sqrt[e*Cot[c + d*x]])
```

fricas [A] time = 0.94, size = 500, normalized size = 3.70

$$\left[-\frac{3\sqrt{2}\sqrt{-e}(\cos(2dx+2c)+1)\arctan\left(\frac{\sqrt{2}\sqrt{-e}\sqrt{\frac{e\cos(2dx+2c)+e}{\sin(2dx+2c)}}(\cos(2dx+2c)+\sin(2dx+2c)+1)}{2(e\cos(2dx+2c)+e)}\right)+3\sqrt{-e}(\cos(2dx+2\cdots}{6\left(ad\cdots\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] [-1/6*(3*sqrt(2)*sqrt(-e)*(cos(2*d*x + 2*c) + 1)*arctan(1/2*sqrt(2)*sqrt(-e
)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2
*d*x + 2*c) + 1)/(e*cos(2*d*x + 2*c) + e)) + 3*sqrt(-e)*(cos(2*d*x + 2*c) +
 1)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) + 2*sqrt(-e)*sqrt((e*cos(2
*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) + e)/(cos(2*d*x + 2*c)
+ sin(2*d*x + 2*c) + 1)) + 4*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)
)*(cos(2*d*x + 2*c) + 3*sin(2*d*x + 2*c) - 1))/(a*d*e^3*cos(2*d*x + 2*c) +
a*d*e^3), 1/12*(3*sqrt(2)*sqrt(e)*(cos(2*d*x + 2*c) + 1)*log(-sqrt(2)*sqrt(
e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(
2*d*x + 2*c) - 1) + 2*e*sin(2*d*x + 2*c) + e) - 12*sqrt(e)*(cos(2*d*x + 2*c
) + 1)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)) - 8*
sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + 3*sin(2
*d*x + 2*c) - 1))/(a*d*e^3*cos(2*d*x + 2*c) + a*d*e^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a\cot(dx+c)+a)(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)*(e*cot(d*x + c))^(5/2)), x)
```

maple [B] time = 0.76, size = 416, normalized size = 3.08

$$-\frac{\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{ad\,e^{\frac{5}{2}}}+\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{8da\,e^3}+\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{4da\,e^3}-\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(5/2)/(a+cot(d*x+c)*a),x)
```

```
[Out] -arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a/d/e^(5/2)+1/8/d/a/e^3*(e^2)^(1/4)*2
^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4
/d/a/e^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)+1)-1/4/d/a/e^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x
+c))^(1/2)+1)-1/8/d/a/e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/4/d/a/e^2*2^(1/2)/(e^2)^(1/4)*arctan(
2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/a/e^2*2^(1/2)/(e^2)^(1/4)
*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/3/a/d/e/(e*cot(d*x+c
))^(3/2)-2/a/d/e^2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.44, size = 154, normalized size = 1.14

$$\frac{e\left(\frac{3\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{ae^3}-\frac{12\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{ae^{\frac{7}{2}}}+\frac{8\left(e-\frac{3e}{\tan(dx+c)}\right)}{ae^3\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}\right)}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*e*(3*(sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x
 + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/
tan(d*x + c))/sqrt(e))/(a*e^3) - 12*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/(a
*e^(7/2)) + 8*(e - 3*e/tan(d*x + c))/(a*e^3*(e/tan(d*x + c))^(3/2)))/d
```

mupad [B] time = 0.93, size = 132, normalized size = 0.98

$$\frac{\sqrt{2}\ \mathrm{atanh}\left(\frac{12\sqrt{2}\,a^3\,d^3\,e^{21/2}\,\sqrt{e\cot(c+d\,x)}}{12\,a^3\,d^3\,e^{11}+12\,a^3\,d^3\,e^{11}\,\cot(c+d\,x)}\right)}{2\,a\,d\,e^{5/2}}-\frac{\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{a\,d\,e^{5/2}}-\frac{\frac{2\cot(c+d\,x)}{e}-\frac{2}{3\,e}}{a\,d\,\left(e\cot\left(c+d\,x\right)\right)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(5/2)*(a + a*cot(c + d*x))),x)
```

```
[Out] (2^(1/2)*atanh((12*2^(1/2)*a^3*d^3*e^(21/2)*(e*cot(c + d*x))^(1/2))/(12*a^3
*d^3*e^11 + 12*a^3*d^3*e^11*cot(c + d*x))))/(2*a*d*e^(5/2)) - atan((e*cot(c
 + d*x))^(1/2)/e^(1/2))/(a*d*e^(5/2)) - ((2*cot(c + d*x))/e - 2/(3*e))/(a*d
*(e*cot(c + d*x))^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{5}{2}}\cot\left(c+dx\right)+\left(e\cot\left(c+dx\right)\right)^{\frac{5}{2}}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(5/2)/(a+a*cot(d*x+c)),x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(5/2)*cot(c + d*x) + (e*cot(c + d*x))**(5/2))
, x)/a
```

3.29 $\int \frac{(e\cot(c+dx))^{5/2}}{(a+a\cot(c+dx))^2}\,dx$

Optimal. Leaf size=281

$$-\frac{e^{5/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}+\frac{e^{5/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}-\frac{3e^{5/}}{}$$

```
[Out] -3/2*e^(5/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d-1/4*e^(5/2)*arctan(
1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d*2^(1/2)+1/4*e^(5/2)*arctan(1+
2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d*2^(1/2)-1/8*e^(5/2)*ln(e^(1/2)+
cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d*2^(1/2)+1/8*e^(5/2)*
ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d*2^(1/2)+1
/2*e^2*(e*cot(d*x+c))^(1/2)/d/(a^2+a^2*cot(d*x+c))
```

Rubi [A] time = 0.54, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {3565, 3653, 12, 3476, 329, 211, 1165, 628, 1162, 617, 204, 3634, 63, 205}

$$\frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2\cot(c+dx)+a^2\right)}-\frac{e^{5/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}+\frac{e^{5/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e}\right.}{4\sqrt{2}\,a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)/(a + a*Cot[c + d*x])^2,x]
```

```
[Out] (-3*e^(5/2)*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(2*a^2*d) - (e^(5/2)*ArcT
an[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(2*Sqrt[2]*a^2*d) + (e^(5/2
)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(2*Sqrt[2]*a^2*d) + (
e^2*Sqrt[e*Cot[c + d*x]])/(2*d*(a^2 + a^2*Cot[c + d*x])) - (e^(5/2)*Log[Sqr
t[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(4*Sqrt[2]*a^2
*d) + (e^(5/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c +
d*x]]])/(4*Sqrt[2]*a^2*d)
```

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 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 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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
```

```
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{5/2}}{(a+a\cot(c+dx))^2}\,dx = \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{-\frac{1}{2}a^2e^3+a^2e^3\cot(c+dx)-\frac{3}{2}a^2e^3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{2a^3}$$

$$= \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{2a^3e^3}{\sqrt{e\cot(c+dx)}}\,dx}{4a^5} + \frac{\left(3e^3\right)\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{4a}$$

$$= \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^3\int \frac{1}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2} + \frac{\left(3e^3\right)\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -c\right.}{4ad}$$

$$= \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\left(3e^2\right)\text{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{2ad} + \frac{e^4\,\text{Subst}\left(\right.}{}$$

$$= -\frac{3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{e^4\,\text{Subst}\left(\int \frac{1}{e^2+x^4}\,dx, x, \sqrt{e}\right.}{a^2d}$$

$$= -\frac{3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{e^3\,\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e}\right.}{2a^2d}$$

$$= -\frac{3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^{5/2}\,\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\right.}{4\sqrt{2}\,a^2}$$

$$= -\frac{3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{e^2\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^{5/2}\log\left(\sqrt{e}+\sqrt{e}\cot(c+\right.}{4\sqrt{2}}$$

$$= -\frac{3e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} - \frac{e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2\sqrt{2}\,a^2d} + \frac{e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\,\mathrm{c}}}{}\right.}{2\sqrt{2}\,a^2d}$$

Mathematica [A] time = 2.02, size = 224, normalized size = 0.80

$$\frac{(e\cot(c+dx))^{5/2}(\sin(c+dx)+\cos(c+dx))\left(2\cot^{\frac{3}{2}}(c+dx)\sec(c+dx)-\frac{1}{2}(\cot(c+dx)+1)\csc(c+dx)\left(\sqrt{2}\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)/(a + a*Cot[c + d*x])^2,x]
```

```
[Out] ((e*Cot[c + d*x])^(5/2)*(-1/2*((1 + Cot[c + d*x])*Csc[c + d*x]*(2*Sqrt[2]*A
rcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[C
ot[c + d*x]]] + 12*ArcTan[Sqrt[Cot[c + d*x]]] + Sqrt[2]*Log[-1 + Sqrt[2]*Sq
rt[Cot[c + d*x]] - Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x
]] + Cot[c + d*x]])) + 2*Cot[c + d*x]^(3/2)*Sec[c + d*x])*(Cos[c + d*x] + S
in[c + d*x]))/(4*a^2*d*Cot[c + d*x]^(5/2)*(1 + Cot[c + d*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{5}{2}}}{(a\cot(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(5/2)/(a*cot(d*x + c) + a)^2, x)
```

maple [A] time = 0.83, size = 234, normalized size = 0.83

$$\frac{e^3\sqrt{e\cot(dx+c)}}{2d\,a^2(e\cot(dx+c)+e)}-\frac{3e^{\frac{5}{2}}\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{2a^2d}+\frac{e^2\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{8d\,a^2}+\frac{e^2\left(e^2\right)^{\frac{1}{4}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)/(a+cot(d*x+c)*a)^2,x)
```

```
[Out] 1/2/d/a^2*e^3*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)+e)-3/2*e^(5/2)*arctan((e*c
ot(d*x+c))^(1/2)/e^(1/2))/a^2/d+1/8/d/a^2*e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot
(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)
-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a^2*e^2*(e^2)
^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d/a^2
*e^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1
)
```

maxima [**A**] time = 0.44, size = 233, normalized size = 0.83

$$\frac{\left(\frac{4\,e^2\sqrt{\frac{e}{\tan(dx+c)}}}{a^2e+\frac{a^2e}{\tan(dx+c)}}-\frac{12\,e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a^2}+\frac{2\,\sqrt{2}\,e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)+2\,\sqrt{2}\,e^{\frac{3}{2}}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)+\sqrt{2}\,e^{\frac{3}{2}}\cdots}{a^2}\cdots}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/8*(4*e^2*sqrt(e/tan(d*x + c))/(a^2*e + a^2*e/tan(d*x + c)) - 12*e^(3/2)*a
rctan(sqrt(e/tan(d*x + c))/sqrt(e))/a^2 + (2*sqrt(2)*e^(3/2)*arctan(1/2*sqr
t(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e)) + 2*sqrt(2)*e^(3/2
)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e)) +
 sqrt(2)*e^(3/2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x +
 c)) - sqrt(2)*e^(3/2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/ta
n(d*x + c)))/a^2)*e/d
```

mupad [**B**] time = 0.90, size = 375, normalized size = 1.33

$$\frac{e^3\,\sqrt{e\cot\left(c+d\,x\right)}}{2\,\left(a^2\,d\,e+a^2\,d\,e\cot\left(c+d\,x\right)\right)}-\mathrm{atan}\left(\frac{e^{20}\,\sqrt{e\cot\left(c+d\,x\right)}\,{\left(-\frac{e^{10}}{256\,a^8\,d^4}\right)}^{1/4}\,16\mathrm{i}}{\frac{36\,e^{23}}{a^2\,d}+64\,a^2\,d\,e^{18}\,\sqrt{-\frac{e^{10}}{256\,a^8\,d^4}}}-\frac{e^{15}\,\sqrt{e\cot\left(c+d\,x\right)}\,{\left(-\frac{e^{10}}{256\,a^8\,d^4}\right)}^{3/4}\,\cdots}{\frac{36\,e^{23}}{a^6\,d^3}+\frac{64\,e^{18}\,\sqrt{-\frac{e^{10}}{256\,a^8\,d^4}}}{a^2\,d}}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)/(a + a*cot(c + d*x))^2,x)
```

```
[Out] (e^3*(e*cot(c + d*x))^(1/2))/(2*(a^2*d*e + a^2*d*e*cot(c + d*x))) - atan((e
^20*(e*cot(c + d*x))^(1/2)*(-e^10/(256*a^8*d^4))^(1/4)*16i)/((36*e^23)/(a^2
```

```
*d) + 64*a^2*d*e^18*(-e^10/(256*a^8*d^4))^(1/2)) - (e^15*(e*cot(c + d*x))^(
1/2)*(-e^10/(256*a^8*d^4))^(3/4)*2304i)/((36*e^23)/(a^6*d^3) + (64*e^18*(-e
^10/(256*a^8*d^4))^(1/2))/(a^2*d)))*(-e^10/(256*a^8*d^4))^(1/4)*2i - (atan(
(4*e^20*(e*cot(c + d*x))^(1/2)*(-e^10/(a^8*d^4))^(1/4))/((36*e^23)/(a^2*d)
- 4*a^2*d*e^18*(-e^10/(a^8*d^4))^(1/2)) + (36*e^15*(e*cot(c + d*x))^(1/2)*(
-e^10/(a^8*d^4))^(3/4))/((36*e^23)/(a^6*d^3) - (4*e^18*(-e^10/(a^8*d^4))^(1
/2))/(a^2*d)))*(-e^10/(a^8*d^4))^(1/4))/2 - (atan(((e*cot(c + d*x))^(1/2)*(
-e^5)^(1/2)*1i)/e^3)*(-e^5)^(1/2)*3i)/(2*a^2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\cot(c+dx))^{\frac{5}{2}}}{\cot^2(c+dx)+2\cot(c+dx)+1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)/(a+a*cot(d*x+c))**2,x)
```

```
[Out] Integral((e*cot(c + d*x))**(5/2)/(cot(c + d*x)**2 + 2*cot(c + d*x) + 1), x)
/a**2
```

3.30 $\int \frac{(e\cot(c+dx))^{3/2}}{(a+a\cot(c+dx))^2}\,dx$

Optimal. Leaf size=279

$$-\frac{e^{3/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}+\frac{e^{3/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}+\ldots$$

```
[Out] 1/2*e^(3/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d+1/4*e^(3/2)*arctan(1
-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d*2^(1/2)-1/4*e^(3/2)*arctan(1+2
^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d*2^(1/2)-1/8*e^(3/2)*ln(e^(1/2)+c
ot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d*2^(1/2)+1/8*e^(3/2)*l
n(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d*2^(1/2)-1/
2*e*(e*cot(d*x+c))^(1/2)/d/(a^2+a^2*cot(d*x+c))
```

Rubi [A] time = 0.56, antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3567, 3653, 12, 16, 3476, 329, 297, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{e^{3/2}\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}+\frac{e^{3/2}\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}+\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)/(a + a*Cot[c + d*x])^2,x]
```

```
[Out] (e^(3/2)*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(2*a^2*d) + (e^(3/2)*ArcTan[
1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(2*Sqrt[2]*a^2*d) - (e^(3/2)*A
rcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(2*Sqrt[2]*a^2*d) - (e*S
qrt[e*Cot[c + d*x]])/(2*d*(a^2 + a^2*Cot[c + d*x])) - (e^(3/2)*Log[Sqrt[e]
+ Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(4*Sqrt[2]*a^2*d) +
 (e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]
])/(4*Sqrt[2]*a^2*d)
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3567

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m
+ 1)*(c + d*Tan[e + f*x])^(n - 1))/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m
 + 1)*(a^2 + b^2)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(
n - 2)*Simp[a*c^2*(m + 1) + a*d^2*(n - 1) + b*c*d*(m - n + 2) - (b*c^2 - 2*
a*c*d - b*d^2)*(m + 1)*Tan[e + f*x] - d*(b*c - a*d)*(m + n)*Tan[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2
 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && LtQ[1, n, 2] && IntegerQ[2
*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
```

```
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{3/2}}{(a+a\cot(c+dx))^2}\,dx = -\frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{\frac{ae^2}{2}-ae^2\cot(c+dx)-\frac{1}{2}ae^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{2a^2}$$

$$= -\frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int -\frac{2a^2e^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{4a^4} - \frac{e^2\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{4a}$$

$$= -\frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{e^2\int \frac{\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2} - \frac{e^2\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -\mathrm{co}\right.}{4ad}$$

$$= -\frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{e\int \sqrt{e\cot(c+dx)}\,dx}{2a^2} + \frac{e\,\mathrm{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx, x, \sqrt{e\cot}\right.}{2ad}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} - \frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^2\,\mathrm{Subst}\left(\int \frac{\sqrt{x}}{e^2+x^2}\,dx, x, e\cot(c\right.}{2a^2d}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} - \frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^2\,\mathrm{Subst}\left(\int \frac{x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot}\right.}{a^2d}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} - \frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{e^2\,\mathrm{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot}\right.}{2a^2d}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} - \frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^{3/2}\,\mathrm{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx,\right.}{4\sqrt{2}\,a^2d}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} - \frac{e\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^{3/2}\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)\right.}{4\sqrt{2}\,a^2d}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2\sqrt{2}\,a^2d} - \frac{e^{3/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c}}{\sqrt{e}}\right.}{2\sqrt{2}\,a^2d}$$

Mathematica [A] time = 2.83, size = 312, normalized size = 1.12

$$-\frac{\sin^2(c+dx)(e\cot(c+dx))^{3/2}\left(4\cot^{\frac{7}{2}}(c+dx)-4\cot^{\frac{5}{2}}(c+dx)+4\cot^{\frac{3}{2}}(c+dx)-4\sqrt{\cot(c+dx)}+\sqrt{2}\cos(2(c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)/(a + a*Cot[c + d*x])^2,x]
```

```
[Out] -1/8*((e*Cot[c + d*x])^(3/2)*(-4*Sqrt[Cot[c + d*x]] + 4*Cot[c + d*x]^(3/2)
- 4*Cot[c + d*x]^(5/2) + 4*Cot[c + d*x]^(7/2) - 2*Sqrt[2]*ArcTan[1 - Sqrt[2
]*Sqrt[Cot[c + d*x]]]*Cos[2*(c + d*x)]*Csc[c + d*x]^4 + 2*Sqrt[2]*ArcTan[1
+ Sqrt[2]*Sqrt[Cot[c + d*x]]]*Cos[2*(c + d*x)]*Csc[c + d*x]^4 - 4*ArcTan[Sq
rt[Cot[c + d*x]]]*Cos[2*(c + d*x)]*Csc[c + d*x]^4 + Sqrt[2]*Cos[2*(c + d*x)
]*Csc[c + d*x]^4*Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] - Sqrt
[2]*Cos[2*(c + d*x)]*Csc[c + d*x]^4*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Co
t[c + d*x]])*Sin[c + d*x]^2)/(a^2*d*Cot[c + d*x]^(3/2)*(-1 + Cot[c + d*x]^2
))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{3}{2}}}{(a\cot(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(3/2)/(a*cot(d*x + c) + a)^2, x)
```

maple [A] time = 0.74, size = 234, normalized size = 0.84

$$-\frac{e^2\sqrt{e\cot(dx+c)}}{2d\,a^2\,(e\cot(dx+c)+e)}+\frac{e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{2a^2d}-\frac{e^2\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{8d\,a^2\left(e^2\right)^{\frac{1}{4}}}-\frac{e^2\sqrt{2}\,\arctan\left(\right.}{4d\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)/(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -1/2/d/a^2*e^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)+e)+1/2*e^(3/2)*arctan((e*
cot(d*x+c))^(1/2)/e^(1/2))/a^2/d-1/8/d/a^2*e^2/(e^2)^(1/4)*2^(1/2)*ln((e*co
t(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c
)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/4/d/a^2*e^2/(e^2
)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/a^
2*e^2/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)
```

maxima [A] time = 0.49, size = 232, normalized size = 0.83

$$-\frac{e\left(\frac{4e\sqrt{\frac{e}{\tan(dx+c)}}}{a^2e+\frac{a^2e}{\tan(dx+c)}}+\frac{e\left(\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}+\cdots\right)}{a^2}\cdots\right)}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/8*e*(4*e*sqrt(e/tan(d*x + c))/(a^2*e + a^2*e/tan(d*x + c)) + e*(2*sqrt(2
)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sq
rt(e) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x +
 c)))/sqrt(e))/sqrt(e) - sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) +
 e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x
+ c)) + e + e/tan(d*x + c))/sqrt(e))/a^2 - 4*sqrt(e)*arctan(sqrt(e/tan(d*x
+ c))/sqrt(e))/a^2)/d
```

mupad [B] time = 0.82, size = 376, normalized size = 1.35

$$-\frac{\mathrm{atan}\left(\left(\frac{4e^{16}\sqrt{e\cot(c+dx)}\left(-\frac{e^6}{a^8d^4}\right)^{1/4}}{\frac{4e^{18}}{a^2d}+4a^2de^{15}\sqrt{-\frac{e^6}{a^8d^4}}}+\frac{4e^{13}\sqrt{e\cot(c+dx)}\left(-\frac{e^6}{a^8d^4}\right)^{3/4}}{\frac{4e^{18}}{a^6d^3}+\frac{4e^{15}\sqrt{-\frac{e^6}{a^8d^4}}}{a^2d}}\right)\left(-\frac{e^6}{a^8d^4}\right)^{1/4}}{2}-\mathrm{atan}\left(\frac{e^{16}\sqrt{e\cot(c+dx)}\left(-\frac{e^6}{256a^8d^4}\right)^{1/4}}{\frac{4e^{18}}{a^2d}-64a^2de^{15}\sqrt{-\frac{e^6}{256a^8d^4}}}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)/(a + a*cot(c + d*x))^2,x)
```

```
[Out] (atan(((e*cot(c + d*x))^(1/2)*(-e^3)^(1/2)*1i)/e^2)*(-e^3)^(1/2)*1i)/(2*a^2
*d) - atan((e^16*(e*cot(c + d*x))^(1/2)*(-e^6/(256*a^8*d^4))^(1/4)*16i)/((4
*e^18)/(a^2*d) - 64*a^2*d*e^15*(-e^6/(256*a^8*d^4))^(1/2)) - (e^13*(e*cot(c
 + d*x))^(1/2)*(-e^6/(256*a^8*d^4))^(3/4)*256i)/((4*e^18)/(a^6*d^3) - (64*e
^15*(-e^6/(256*a^8*d^4))^(1/2))/(a^2*d)))*(-e^6/(256*a^8*d^4))^(1/4)*2i - (
e^2*(e*cot(c + d*x))^(1/2))/(2*(a^2*d*e + a^2*d*e*cot(c + d*x))) - (atan((4
*e^16*(e*cot(c + d*x))^(1/2)*(-e^6/(a^8*d^4))^(1/4))/((4*e^18)/(a^2*d) + 4*
a^2*d*e^15*(-e^6/(a^8*d^4))^(1/2)) + (4*e^13*(e*cot(c + d*x))^(1/2)*(-e^6/(
a^8*d^4))^(3/4))/((4*e^18)/(a^6*d^3) + (4*e^15*(-e^6/(a^8*d^4))^(1/2))/(a^2
*d)))*(-e^6/(a^8*d^4))^(1/4))/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\cot(c+dx))^{\frac{3}{2}}}{\cot^2(c+dx)+2\cot(c+dx)+1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)/(a+a*cot(d*x+c))**2,x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)/(cot(c + d*x)**2 + 2*cot(c + d*x) + 1), x)
/a**2
```

3.31 $\int \frac{\sqrt{e\cot(c+dx)}}{(a+a\cot(c+dx))^2}\,dx$

Optimal. Leaf size=278

$$\frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2\cot(c+dx)+a^2\right)}+\frac{\sqrt{e}\,\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}-\frac{\sqrt{e}\,\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{}\right.}{4\sqrt{2}\,a^2d}$$

```
[Out] 1/2*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/a^2/d+1/4*arctan(1-2^(1/2)
*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/a^2/d*2^(1/2)-1/4*arctan(1+2^(1/2)*(
e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/a^2/d*2^(1/2)+1/8*ln(e^(1/2)+cot(d*x+c
)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/a^2/d*2^(1/2)-1/8*ln(e^(1/2
)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/a^2/d*2^(1/2)+1/
2*(e*cot(d*x+c))^(1/2)/d/(a^2+a^2*cot(d*x+c))
```

Rubi [A] time = 0.53, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {3568, 3653, 12, 3476, 329, 211, 1165, 628, 1162, 617, 204, 3634, 63, 205}

$$\frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2\cot(c+dx)+a^2\right)}+\frac{\sqrt{e}\,\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2d}-\frac{\sqrt{e}\,\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{}\right.}{4\sqrt{2}\,a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]/(a + a*Cot[c + d*x])^2,x]
```

```
[Out] (Sqrt[e]*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(2*a^2*d) + (Sqrt[e]*ArcTan[
1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(2*Sqrt[2]*a^2*d) - (Sqrt[e]*A
rcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(2*Sqrt[2]*a^2*d) + Sqrt
[e*Cot[c + d*x]]/(2*d*(a^2 + a^2*Cot[c + d*x])) + (Sqrt[e]*Log[Sqrt[e] + Sq
rt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(4*Sqrt[2]*a^2*d) - (Sq
rt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(
4*Sqrt[2]*a^2*d)
```

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 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 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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3568

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(a + b*Tan[e + f*x])^(m + 1)*(c +
d*Tan[e + f*x])^n)/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m + 1)*(a^2 + b^2
)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n - 1)*Simp[a*c*
(m + 1) - b*d*n - (b*c - a*d)*(m + 1)*Tan[e + f*x] - b*d*(m + n + 1)*Tan[e
+ f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &
& NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && GtQ[n, 0] && Inte
gerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
```

```
!GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{e\cot(c+dx)}}{(a+a\cot(c+dx))^2}\,dx = \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{-\frac{ae}{2}-ae\cot(c+dx)+\frac{1}{2}ae\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{2a^2}$$

$$= \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int -\frac{2a^2e}{\sqrt{e\cot(c+dx)}}\,dx}{4a^4} - \frac{e\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{4a}$$

$$= \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{e\int \frac{1}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2} - \frac{e\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -\cot(c+\right.}{4ad}$$

$$= \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{\mathrm{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{2ad} - \frac{e^2\,\mathrm{Subst}\left(\int \frac{}{\sqrt{x}\,(e\right.}{}$$

$$= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e^2\,\mathrm{Subst}\left(\int \frac{1}{e^2+x^4}\,dx, x, \sqrt{e\cot(\right.}{a^2d}$$

$$= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} - \frac{e\,\mathrm{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c\right.}{2a^2d}$$

$$= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{\sqrt{e}\,\mathrm{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x\right.}{4\sqrt{2}\,a^2d}$$

$$= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{\sqrt{e\cot(c+dx)}}{2d\left(a^2+a^2\cot(c+dx)\right)} + \frac{\sqrt{e}\,\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\right.}{4\sqrt{2}\,a^2d}$$

$$= \frac{\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d} + \frac{\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2\sqrt{2}\,a^2d} - \frac{\sqrt{e}\,\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+d}}{\sqrt{e}}\right.}{2\sqrt{2}\,a^2d}$$

Mathematica [A] time = 1.30, size = 207, normalized size = 0.74

$$\frac{\csc(c+dx)\sqrt{e\cot(c+dx)}\,(\sin(c+dx)+\cos(c+dx))\left(\frac{1}{2}(\tan(c+dx)+1)\sqrt{\cot(c+dx)}\,\left(\sqrt{2}\,\log\left(-\cot(c+dx)+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]/(a + a*Cot[c + d*x])^2,x]
```

```
[Out] (Sqrt[e*Cot[c + d*x]]*Csc[c + d*x]*(Cos[c + d*x] + Sin[c + d*x])*(2 + (Sqrt
[Cot[c + d*x]]*(2*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*Sqrt[2
]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 4*ArcTan[Sqrt[Cot[c + d*x]]] + S
qrt[2]*Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] - Sqrt[2]*Log[1
+ Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])*(1 + Tan[c + d*x]))/2))/(4*a^
2*d*(1 + Cot[c + d*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \cot(dx + c)}}{(a \cot(dx + c) + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cot(d*x + c))/(a*cot(d*x + c) + a)^2, x)
```

maple [A] time = 0.79, size = 223, normalized size = 0.80

$$-\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{8d\,a^2}-\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{4d\,a^2}+\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\cdots\right.}{4d\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)/(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -1/8/d/a^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2)))-1/4/d/a^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/
```

```
4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/a^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d/a^2*e*(e*cot(d*x+c))^(1/2)/(e*cot(d
*x+c)+e)+1/2*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/a^2/d
```

maxima [A] time = 0.58, size = 231, normalized size = 0.83

$$\frac{e\left(\frac{4\sqrt{\frac{e}{\tan(dx+c)}}}{a^2e+\frac{a^2e}{\tan(dx+c)}} - \frac{\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}} + \frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}} + \frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}} - \frac{\sqrt{2}\log\left(\cdots\right.}{}}{a^2}\right.}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/8*e*(4*sqrt(e/tan(d*x + c))/(a^2*e + a^2*e/tan(d*x + c)) - (2*sqrt(2)*arc
tan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e)
 + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))
/sqrt(e))/sqrt(e) + sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e +
e/tan(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c))
 + e + e/tan(d*x + c))/sqrt(e))/a^2 + 4*arctan(sqrt(e/tan(d*x + c))/sqrt(e)
)/(a^2*sqrt(e)))/d
```

mupad [B] time = 0.72, size = 366, normalized size = 1.32

$$\frac{\operatorname{atan}\left(\frac{4e^{12}\sqrt{e\cot(c+d\,x)}\left(-\frac{e^2}{a^8d^4}\right)^{1/4}}{\frac{4e^{13}}{a^2d}-4a^2d\,e^{12}\sqrt{-\frac{e^2}{a^8d^4}}} + \frac{4e^{11}\sqrt{e\cot(c+d\,x)}\left(-\frac{e^2}{a^8d^4}\right)^{3/4}}{\frac{4e^{13}}{a^6d^3}-\frac{4e^{12}\sqrt{-\frac{e^2}{a^8d^4}}}{a^2d}}\right)\left(-\frac{e^2}{a^8d^4}\right)^{1/4}}{2} + \operatorname{atan}\left(\frac{e^{12}\sqrt{e\cot(c+d\,x)}\left(-\frac{e^2}{256a^8d^4}\right)^{1/4}16i\cdots}{\frac{4e^{13}}{a^2d}+64a^2d\,e^{12}\sqrt{-\frac{e^2}{256a^8d^4}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)/(a + a*cot(c + d*x))^2,x)
```

```
[Out] (atan((4*e^12*(e*cot(c + d*x))^(1/2)*(-e^2/(a^8*d^4))^(1/4))/((4*e^13)/(a^2
*d) - 4*a^2*d*e^12*(-e^2/(a^8*d^4))^(1/2)) + (4*e^11*(e*cot(c + d*x))^(1/2)
*(-e^2/(a^8*d^4))^(3/4))/((4*e^13)/(a^6*d^3) - (4*e^12*(-e^2/(a^8*d^4))^(1/
2))/(a^2*d)))*(-e^2/(a^8*d^4))^(1/4))/2 + atan((e^12*(e*cot(c + d*x))^(1/2)
*(-e^2/(256*a^8*d^4))^(1/4)*16i)/((4*e^13)/(a^2*d) + 64*a^2*d*e^12*(-e^2/(2
```

```
56*a^8*d^4))^(1/2)) - (e^11*(e*cot(c + d*x))^(1/2)*(-e^2/(256*a^8*d^4))^(3/
4)*256i)/((4*e^13)/(a^6*d^3) + (64*e^12*(-e^2/(256*a^8*d^4))^(1/2))/(a^2*d)
))*(-e^2/(256*a^8*d^4))^(1/4)*2i + (e*(e*cot(c + d*x))^(1/2))/(2*(a^2*d*e +
 a^2*d*e*cot(c + d*x))) - ((-e)^(1/2)*atan(((e*cot(c + d*x))^(1/2)*1i)/(-e)
^(1/2))*1i)/(2*a^2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{e\cot(c+dx)}}{\cot^2(c+dx)+2\cot(c+dx)+1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)/(a+a*cot(d*x+c))**2,x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))/(cot(c + d*x)**2 + 2*cot(c + d*x) + 1), x)/a*
*2
```

3.32 $\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2}\,dx$

Optimal. Leaf size=281

$$-\frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2\cot(c+dx)+a^2\right)}+\frac{\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}\,+\sqrt{e}\right)}{4\sqrt{2}\,a^2d\sqrt{e}}-\frac{\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c\right.}{4\sqrt{2}\,a^2d\sqrt{e}}$$

```
[Out] -3/2*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(1/2)-1/4*arctan(1-2^(1/2
)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d*2^(1/2)/e^(1/2)+1/4*arctan(1+2^(1/2)*
(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d*2^(1/2)/e^(1/2)+1/8*ln(e^(1/2)+cot(d*x+
c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d*2^(1/2)/e^(1/2)-1/8*ln(e^(1/
2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d*2^(1/2)/e^(1/2)-1
/2*(e*cot(d*x+c))^(1/2)/d/e/(a^2+a^2*cot(d*x+c))
```

Rubi [A] time = 0.57, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3569, 3653, 12, 16, 3476, 329, 297, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2\cot(c+dx)+a^2\right)}+\frac{\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}\,+\sqrt{e}\right)}{4\sqrt{2}\,a^2d\sqrt{e}}-\frac{\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c\right.}{4\sqrt{2}\,a^2d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^2),x]
```

```
[Out] (-3*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(2*a^2*d*Sqrt[e]) - ArcTan[1 - (S
qrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]/(2*Sqrt[2]*a^2*d*Sqrt[e]) + ArcTan[1
+ (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]/(2*Sqrt[2]*a^2*d*Sqrt[e]) - Sqrt[
e*Cot[c + d*x]]/(2*d*e*(a^2 + a^2*Cot[c + d*x])) + Log[Sqrt[e] + Sqrt[e]*Co
t[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]]/(4*Sqrt[2]*a^2*d*Sqrt[e]) - Log[
Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]]/(4*Sqrt[2]*a
^2*d*Sqrt[e])
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
```

```
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2}\,dx = -\frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{-\frac{3a^2e}{2}+a^2e\cot(c+dx)-\frac{1}{2}a^2e\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{2a^3e}$$

$$= -\frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} + \frac{3\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{4a} - \frac{\int \frac{2a^3e\,\mathrm{c}}{\sqrt{e\,\mathrm{co}}}}{4}$$

$$= -\frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{2a^2} + \frac{3\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax}\right.}{4}$$

$$= -\frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \sqrt{e\cot(c+dx)}\,dx}{2a^2e} - \frac{3\,\mathrm{Subst}\left(\int \frac{1}{a+\frac{ax^2}{e}}\right.}{}$$

$$= -\frac{3\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d\sqrt{e}} - \frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} + \frac{\mathrm{Subst}\left(\int \frac{\sqrt{x}}{e^2+x^2}\right.}{2}$$

$$= -\frac{3\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d\sqrt{e}} - \frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} + \frac{\mathrm{Subst}\left(\int \frac{x^2}{e^2+x^4}\right.}{}$$

$$= -\frac{3\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d\sqrt{e}} - \frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} - \frac{\mathrm{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\right.}{}$$

$$= -\frac{3\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d\sqrt{e}} - \frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} + \frac{\mathrm{Subst}\left(\int \frac{1}{e-\sqrt{2}\,\sqrt{}}\right.}{}$$

$$= -\frac{3\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d\sqrt{e}} - \frac{\sqrt{e\cot(c+dx)}}{2de\left(a^2+a^2\cot(c+dx)\right)} + \frac{\log\left(\sqrt{e}+\sqrt{e}\,\mathrm{c}\right.}{}$$

$$= -\frac{3\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2d\sqrt{e}} - \frac{\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2\sqrt{2}\,a^2d\sqrt{e}} + \frac{\tan^{-1}\left(1+\frac{\sqrt{2}\,\sqrt{}}{}\right.}{2\sqrt{2}\,a^2d}$$

Mathematica [A] time = 0.84, size = 337, normalized size = 1.20

$$-\frac{\sqrt{\cot(c+dx)}\left(4\sin(c+dx)\sqrt{\cot(c+dx)}-\sqrt{2}\cos(c+dx)\log\left(-\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}-1\right)+\sqrt{2}\,\mathrm{co}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^2),x]
```

```
[Out] -1/8*(Sqrt[Cot[c + d*x]]*(12*ArcTan[Sqrt[Cot[c + d*x]]]*Cos[c + d*x] - Sqrt
[2]*Cos[c + d*x]*Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] + Sqrt
[2]*Cos[c + d*x]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] + 12*Ar
cTan[Sqrt[Cot[c + d*x]]]*Sin[c + d*x] + 4*Sqrt[Cot[c + d*x]]*Sin[c + d*x] -
 Sqrt[2]*Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]]*Sin[c + d*x] +
 Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]*Sin[c + d*x] +
2*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]]*(Cos[c + d*x] + Sin[c + d*
x]) - 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]*(Cos[c + d*x] + Sin[
c + d*x])))/(a^2*d*Sqrt[e*Cot[c + d*x]]*(Cos[c + d*x] + Sin[c + d*x]))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a \cot\left(dx+c\right)+a\right)^{2} \sqrt{e \cot\left(dx+c\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)^2*sqrt(e*cot(d*x + c))), x)
```

maple [A] time = 0.71, size = 222, normalized size = 0.79

$$-\frac{\sqrt{e\cot\left(dx+c\right)}}{2d\,a^{2}\left(e\cot\left(dx+c\right)+e\right)}-\frac{3\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{2a^{2}d\sqrt{e}}+\frac{\sqrt{2}\;\ln\left(\frac{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^{2}}}\right)}{8d\,a^{2}\left(e^{2}\right)^{\frac{1}{4}}}+\frac{\sqrt{2}\;\arctan\left(\frac{\sqrt{2}\ \cdots}{\cdots}\right.}{4d\,a^{2}\left(\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(1/2)/(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -1/2/d/a^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)+e)-3/2*arctan((e*cot(d*x+c))^
(1/2)/e^(1/2))/a^2/d/e^(1/2)+1/8/d/a^2/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)
```

```
-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^
(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a^2/(e^2)^(1/4)*2^(1
/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d/a^2/(e^2)^(1/4
)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.55, size = 238, normalized size = 0.85

$$-\frac{e\left(\frac{4\sqrt{\frac{e}{\tan(dx+c)}}}{a^2e^2+\frac{a^2e^2}{\tan(dx+c)}}-\frac{\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,\mathrm{lo}\cdots}{\cdots}}{a^2e}\cdots\right.}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/8*e*(4*sqrt(e/tan(d*x + c))/(a^2*e^2 + a^2*e^2/tan(d*x + c)) - (2*sqrt(2
)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sq
rt(e) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x +
 c)))/sqrt(e))/sqrt(e) - sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) +
 e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x
+ c)) + e + e/tan(d*x + c))/sqrt(e))/(a^2*e) + 12*arctan(sqrt(e/tan(d*x + c
))/sqrt(e))/(a^2*e^(3/2)))/d
```

mupad [B] time = 0.81, size = 366, normalized size = 1.30

$$\frac{\mathrm{atan}\left(\frac{4e^8\sqrt{e\cot(c+dx)}\left(-\frac{1}{a^8d^4e^2}\right)^{1/4}}{\frac{4e^8}{a^2d}+36a^2de^9\sqrt{-\frac{1}{a^8d^4e^2}}}+\frac{36e^9\sqrt{e\cot(c+dx)}\left(-\frac{1}{a^8d^4e^2}\right)^{3/4}}{\frac{4e^8}{a^6d^3}+\frac{36e^9\sqrt{-\frac{1}{a^8d^4e^2}}}{a^2d}}\right)\left(-\frac{1}{a^8d^4e^2}\right)^{1/4}}{2}+\mathrm{atan}\left(\frac{e^8\sqrt{e\cot(c+dx)}\left(-\frac{1}{256a^8d^4e^2}\right)\cdots}{\frac{4e^8}{a^2d}-576a^2de^9\sqrt{-\frac{1}{256a^8d^4\cdots}}}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(1/2)*(a + a*cot(c + d*x))^2),x)
```

```
[Out] (atan((4*e^8*(e*cot(c + d*x))^(1/2)*(-1/(a^8*d^4*e^2))^(1/4))/((4*e^8)/(a^2
*d) + 36*a^2*d*e^9*(-1/(a^8*d^4*e^2))^(1/2)) + (36*e^9*(e*cot(c + d*x))^(1/
2)*(-1/(a^8*d^4*e^2))^(3/4))/((4*e^8)/(a^6*d^3) + (36*e^9*(-1/(a^8*d^4*e^2)
)^(1/2))/(a^2*d)))*(-1/(a^8*d^4*e^2))^(1/4))/2 + atan((e^8*(e*cot(c + d*x))
^(1/2)*(-1/(256*a^8*d^4*e^2))^(1/4)*16i)/((4*e^8)/(a^2*d) - 576*a^2*d*e^9*(
```

```
-1/(256*a^8*d^4*e^2))^(1/2)) - (e^9*(e*cot(c + d*x))^(1/2)*(-1/(256*a^8*d^4
*e^2))^(3/4)*2304i)/((4*e^8)/(a^6*d^3) - (576*e^9*(-1/(256*a^8*d^4*e^2))^(1
/2))/(a^2*d)))*(-1/(256*a^8*d^4*e^2))^(1/4)*2i - (e*cot(c + d*x))^(1/2)/(2*
(a^2*d*e + a^2*d*e*cot(c + d*x))) - (atan(((e*cot(c + d*x))^(1/2)*1i)/(-e)^
(1/2))*3i)/(2*a^2*d*(-e)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{\sqrt{e\cot(c+dx)}\cot^2(c+dx)+2\sqrt{e\cot(c+dx)}\cot(c+dx)+\sqrt{e\cot(c+dx)}}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(1/2)/(a+a*cot(d*x+c))**2,x)
```

```
[Out] Integral(1/(sqrt(e*cot(c + d*x))*cot(c + d*x)**2 + 2*sqrt(e*cot(c + d*x))*c
ot(c + d*x) + sqrt(e*cot(c + d*x))), x)/a**2
```

3.33 $\int \frac{1}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^2}\,dx$

Optimal. Leaf size=306

$$-\frac{\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{3/2}}+\frac{\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{3/2}}+\frac{5\tan^{-1}\left(\sqrt{\cdots}\right.}{2a^2d\cdots}$$

```
[Out] 5/2*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(3/2)-1/4*arctan(1-2^(1/2)
*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(3/2)*2^(1/2)+1/4*arctan(1+2^(1/2)*(
e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(3/2)*2^(1/2)-1/8*ln(e^(1/2)+cot(d*x+c
)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d/e^(3/2)*2^(1/2)+1/8*ln(e^(1/2
)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d/e^(3/2)*2^(1/2)+5/
2/a^2/d/e/(e*cot(d*x+c))^(1/2)-1/2/d/e/(a^2+a^2*cot(d*x+c))/(e*cot(d*x+c))^
(1/2)
```

Rubi [A] time = 0.80, antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3569, 3649, 3653, 12, 3476, 329, 211, 1165, 628, 1162, 617, 204, 3634, 63, 205}

$$-\frac{\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{3/2}}+\frac{\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{3/2}}+\frac{5\tan^{-1}\left(\sqrt{\cdots}\right.}{2a^2d\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^2),x]
```

```
[Out] (5*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(2*a^2*d*e^(3/2)) - ArcTan[1 - (Sq
rt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]/(2*Sqrt[2]*a^2*d*e^(3/2)) + ArcTan[1 +
 (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]/(2*Sqrt[2]*a^2*d*e^(3/2)) + 5/(2*a
^2*d*e*Sqrt[e*Cot[c + d*x]]) - 1/(2*d*e*Sqrt[e*Cot[c + d*x]]*(a^2 + a^2*Cot
[c + d*x])) - Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d
*x]]]/(4*Sqrt[2]*a^2*d*e^(3/2)) + Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt
[2]*Sqrt[e*Cot[c + d*x]]]/(4*Sqrt[2]*a^2*d*e^(3/2))
```

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 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 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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
```

```
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^2}\,dx = -\frac{1}{2de\sqrt{e\cot(c+dx)}\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int -\frac{\frac{5a^2e}{2}+a^2e\cot(c+dx)-\frac{3}{2}a^2e}{(e\cot(c+dx))^{3/2}(a+a\cot}}{2a^3e}$$

$$= \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(a^2+a^2\cot(c+dx)\right)} -$$

$$= \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(a^2+a^2\cot(c+dx)\right)} -$$

$$= \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(a^2+a^2\cot(c+dx)\right)} -$$

$$= \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(a^2+a^2\cot(c+dx)\right)} +$$

$$= \frac{5\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{3/2}} + \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(\right.}$$

$$= \frac{5\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{3/2}} + \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(\right.}$$

$$= \frac{5\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{3/2}} + \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(\right.}$$

$$= \frac{5\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{3/2}} + \frac{5}{2a^2de\sqrt{e\cot(c+dx)}} - \frac{1}{2de\sqrt{e\cot(c+dx)}\left(\right.}$$

$$= \frac{5\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{3/2}} - \frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2\sqrt{2}\,a^2de^{3/2}} + \frac{\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{}}{}\right.}{2\sqrt{2}\,a^2d}$$

Mathematica [A] time = 1.33, size = 203, normalized size = 0.66

$$\frac{\cot^{\frac{3}{2}}(c+dx)\left(\frac{\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-\log\left(-\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}-1\right)}{\sqrt{2}} - \sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\cot(c+dx)}\right)+\sqrt{2}\right.}{4a^2d(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^2),x]
```

```
[Out] (Cot[c + d*x]^(3/2)*(-(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]]) + Sq
rt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 10*ArcTan[Sqrt[Cot[c + d*x]]
] + (-Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] + Log[1 + Sqrt[2]
*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])/Sqrt[2] + (2*(5*Cos[c + d*x] + 4*Sin[c
 + d*x]))/(Sqrt[Cot[c + d*x]]*(Cos[c + d*x] + Sin[c + d*x]))))/(4*a^2*d*(e*
Cot[c + d*x])^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a\cot(dx+c)+a)^2\,(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)^2*(e*cot(d*x + c))^(3/2)), x)
```

maple [A] time = 0.65, size = 255, normalized size = 0.83

$$\frac{\sqrt{e\cot(dx+c)}}{2d\,a^2e\,(e\cot(dx+c)+e)}+\frac{5\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{2a^2d\,e^{\frac{3}{2}}}+\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{8d\,a^2e^2}+\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(3/2)/(a+cot(d*x+c)*a)^2,x)
```

```
[Out] 1/2/d/a^2/e*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)+e)+5/2*arctan((e*cot(d*x+c))
^(1/2)/e^(1/2))/a^2/d/e^(3/2)+1/8/d/a^2/e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d
*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(
```

```
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/4/d/a^2/e^2*(e^2)^(
1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d/a^2/e
^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+
2/a^2/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.87, size = 256, normalized size = 0.84

$$\frac{e\left(\frac{4\left(4\,e+\frac{5\,e}{\tan(dx+c)}\right)}{a^2e^3\sqrt{\frac{e}{\tan(dx+c)}}+a^2e^2\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}+\frac{\frac{2\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{e^{\frac{3}{2}}}+\frac{2\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{e^{\frac{3}{2}}}+\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e\right.}{e^{\frac{3}{2}}}}{a^2e}\right.}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/8*e*(4*(4*e + 5*e/tan(d*x + c))/(a^2*e^3*sqrt(e/tan(d*x + c)) + a^2*e^2*(
e/tan(d*x + c))^(3/2)) + (2*sqrt(2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2
*sqrt(e/tan(d*x + c)))/sqrt(e))/e^(3/2) + 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sq
rt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/e^(3/2) + sqrt(2)*log(sqrt
(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/e^(3/2) - sqrt(2)*lo
g(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/e^(3/2))/(a^2
*e) + 20*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/(a^2*e^(5/2)))/d
```

mupad [B] time = 0.92, size = 414, normalized size = 1.35

$$\frac{\frac{5\cot(c+d\,x)}{2}+2}{a^2\,d\,(e\cot(c+d\,x))^{3/2}+a^2\,d\,e\,\sqrt{e\cot(c+d\,x)}}-\frac{\mathrm{atan}\left(\frac{2048\,a^{10}\,d^5\,e^{13}\,\sqrt{e\cot(c+d\,x)}\,\left(-\frac{1}{a^8\,d^4\,e^6}\right)^{1/4}}{51200\,a^8\,d^4\,e^{12}-2048\,a^{12}\,d^6\,e^{15}\,\sqrt{-\frac{1}{a^8\,d^4\,e^6}}}+\frac{51200\,a^{14}\,d^7\,e^{16}\,\sqrt{e\cot(c+d\,x)}}{51200\,a^8\,d^4\,e^{12}-2048\,a^{12}\,d^6\,e^{1}}\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(3/2)*(a + a*cot(c + d*x))^2),x)
```

```
[Out] ((5*cot(c + d*x))/2 + 2)/(a^2*d*(e*cot(c + d*x))^(3/2) + a^2*d*e*(e*cot(c +
 d*x))^(1/2)) - (atan((2048*a^10*d^5*e^13*(e*cot(c + d*x))^(1/2)*(-1/(a^8*d
^4*e^6))^(1/4))/(51200*a^8*d^4*e^12 - 2048*a^12*d^6*e^15*(-1/(a^8*d^4*e^6))
^(1/2)) + (51200*a^14*d^7*e^16*(e*cot(c + d*x))^(1/2)*(-1/(a^8*d^4*e^6))^(3
/4))/(51200*a^8*d^4*e^12 - 2048*a^12*d^6*e^15*(-1/(a^8*d^4*e^6))^(1/2)))*(-
```

```
1/(a^8*d^4*e^6))^(1/4))/2 - atan((a^10*d^5*e^13*(e*cot(c + d*x))^(1/2)*(-1/
(256*a^8*d^4*e^6))^(1/4)*8192i)/(51200*a^8*d^4*e^12 + 32768*a^12*d^6*e^15*(
-1/(256*a^8*d^4*e^6))^(1/2)) - (a^14*d^7*e^16*(e*cot(c + d*x))^(1/2)*(-1/(2
56*a^8*d^4*e^6))^(3/4)*3276800i)/(51200*a^8*d^4*e^12 + 32768*a^12*d^6*e^15*
(-1/(256*a^8*d^4*e^6))^(1/2)))*(-1/(256*a^8*d^4*e^6))^(1/4)*2i + (atan(((e*
cot(c + d*x))^(1/2)*(-e^3)^(1/2)*1i)/e^2)*(-e^3)^(1/2)*5i)/(2*a^2*d*e^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{(e\cot(c+dx))^{\frac{3}{2}}\cot^2(c+dx)+2(e\cot(c+dx))^{\frac{3}{2}}\cot(c+dx)+(e\cot(c+dx))^{\frac{3}{2}}}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(3/2)/(a+a*cot(d*x+c))**2,x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(3/2)*cot(c + d*x)**2 + 2*(e*cot(c + d*x))**(
3/2)*cot(c + d*x) + (e*cot(c + d*x))**(3/2)), x)/a**2
```

3.34 $\int \frac{1}{(e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^2}\,dx$

Optimal. Leaf size=331

$$-\frac{\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{5/2}}+\frac{\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{5/2}}-\frac{7\tan^{-1}\left(\sqrt{e}\right.}{2a^2d}$$

```
[Out] -7/2*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(5/2)+7/6/a^2/d/e/(e*cot(
d*x+c))^(3/2)-1/2/d/e/(e*cot(d*x+c))^(3/2)/(a^2+a^2*cot(d*x+c))+1/4*arctan(
1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(5/2)*2^(1/2)-1/4*arctan(1+
2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/a^2/d/e^(5/2)*2^(1/2)-1/8*ln(e^(1/2)+
cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d/e^(5/2)*2^(1/2)+1/8*
ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/a^2/d/e^(5/2)*2
^(1/2)-9/2/a^2/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 1.08, antiderivative size = 331, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3569, 3649, 3653, 12, 16, 3476, 329, 297, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{9}{2a^2de^2\sqrt{e\cot(c+dx)}}-\frac{\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{4\sqrt{2}\,a^2de^{5/2}}+\frac{\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+\right.}{4\sqrt{2}\,a^2de^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^2),x]
```

```
[Out] (-7*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(2*a^2*d*e^(5/2)) + ArcTan[1 - (S
qrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]/(2*Sqrt[2]*a^2*d*e^(5/2)) - ArcTan[1
+ (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]/(2*Sqrt[2]*a^2*d*e^(5/2)) + 7/(6*
a^2*d*e*(e*Cot[c + d*x])^(3/2)) - 9/(2*a^2*d*e^2*Sqrt[e*Cot[c + d*x]]) - 1/
(2*d*e*(e*Cot[c + d*x])^(3/2)*(a^2 + a^2*Cot[c + d*x])) - Log[Sqrt[e] + Sqr
t[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]]/(4*Sqrt[2]*a^2*d*e^(5/2))
 + Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]]/(4*Sq
rt[2]*a^2*d*e^(5/2))
```

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 16

```
Int[(u_.)*(v_)^(m_.)*((b_)*(v_))^(n_), x_Symbol] :> Dist[1/b^m, Int[u*(b*v)
^(m + n), x], x] /; FreeQ[{b, n}, x] && IntegerQ[m]
```

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 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 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 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 329

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

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 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 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 3476

```
Int[((b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Subst[Int[
x^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{b, c, d, n}, x] &&  !
IntegerQ[n]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^2}\,dx = -\frac{1}{2de(e\cot(c+dx))^{3/2}\left(a^2+a^2\cot(c+dx)\right)} - \frac{\int \frac{-\frac{7a^2e}{2}+a^2e\cot(c+dx)-\frac{5}{2}a}{(e\cot(c+dx))^{5/2}(a+a\,c}}{2a^3e}$$

$$= \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{1}{2de(e\cot(c+dx))^{3/2}\left(a^2+a^2\cot(c+dx)\right)}$$

$$= \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c+dx)}} - \frac{}{2de(e\cot(c+dx)}$$

$$= \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c+dx)}} - \frac{}{2de(e\cot(c+dx)}$$

$$= \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c+dx)}} - \frac{}{2de(e\cot(c+dx)}$$

$$= \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c+dx)}} - \frac{}{2de(e\cot(c+dx)}$$

$$= -\frac{7\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{5/2}} + \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c}}$$

$$= -\frac{7\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{5/2}} + \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c}}$$

$$= -\frac{7\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{5/2}} + \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c}}$$

$$= -\frac{7\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{5/2}} + \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c}}$$

$$= -\frac{7\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{5/2}} + \frac{7}{6a^2de(e\cot(c+dx))^{3/2}} - \frac{9}{2a^2de^2\sqrt{e\cot(c}}$$

$$= -\frac{7\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2a^2de^{5/2}} + \frac{\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{2\sqrt{2}\,a^2de^{5/2}} - \frac{\tan^{-1}\left(1+\frac{\sqrt{2}}{}\right.}{2\sqrt{2}\,a^2}$$

Mathematica [A] time = 6.34, size = 467, normalized size = 1.41

$$\frac{\cot^3(c+dx)\csc^2(c+dx)(\sin(c+dx)+\cos(c+dx))^2\left(-4\tan(c+dx)+\frac{2}{3}\sec^2(c+dx)-\frac{\sin(c+dx)}{2(\sin(c+dx)+\cos(c+dx))}-\frac{2}{3}\right.}{d(a\cot(c+dx)+a)^2(e\cot(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^2),x]
```

```
[Out] (Cot[c + d*x]^3*Csc[c + d*x]^2*(Cos[c + d*x] + Sin[c + d*x])^2*(-2/3 + (2*S
ec[c + d*x]^2)/3 - Sin[c + d*x]/(2*(Cos[c + d*x] + Sin[c + d*x])) - 4*Tan[c
 + d*x]))/(d*(e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^2) + (Cot[c + d*x]
^(5/2)*Csc[c + d*x]^2*(Cos[c + d*x] + Sin[c + d*x])^2*((-16*ArcTan[Sqrt[Cot
[c + d*x]]]*(1 + Cot[c + d*x])*Csc[c + d*x]^3*Sec[c + d*x])/((1 + Cot[c + d
*x]^2)^2*(1 + Tan[c + d*x])) + (Cos[2*(c + d*x)]*Csc[c + d*x]^3*(-Log[-1 +
Sqrt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] + Log[1 + Sqrt[2]*Sqrt[Cot[c + d
*x]] + Cot[c + d*x]])*Sec[c + d*x])/(Sqrt[2]*(-1 + Cot[c + d*x])*(1 + Cot[c
 + d*x]^2)*(1 + Tan[c + d*x])) + ((-(Sqrt[2]*(-ArcTan[1 - Sqrt[2]*Sqrt[Cot[
c + d*x]]] + ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]])) + 2*ArcTan[Sqrt[Cot[c
 + d*x]]])*(1 + Cot[c + d*x])*Csc[c + d*x]^2*Sec[c + d*x]^2*Sin[2*(c + d*x)
])/(2*(1 + Cot[c + d*x]^2)*(1 + Tan[c + d*x]))))/(4*d*(e*Cot[c + d*x])^(5/2
)*(a + a*Cot[c + d*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a\cot(dx+c)+a)^2(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)^2*(e*cot(d*x + c))^(5/2)), x)
```

maple [A] time = 0.67, size = 276, normalized size = 0.83

$$-\frac{\sqrt{e\cot\left(dx+c\right)}}{2d\,a^{2}e^{2}\left(e\cot\left(dx+c\right)+e\right)}-\frac{7\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{2a^{2}d\,e^{\frac{5}{2}}}-\frac{\sqrt{2}\;\ln\left(\frac{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^{2}}}\right)}{8d\,a^{2}e^{2}\left(e^{2}\right)^{\frac{1}{4}}}-\frac{\sqrt{2}\;\arctan\left(\frac{\sqrt{2}}{\cdots}\right.}{4d\,a^{2}e^{2}\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(5/2)/(a+cot(d*x+c)*a)^2,x)
```

```
[Out] -1/2/d/a^2/e^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)+e)-7/2*arctan((e*cot(d*x+
c))^(1/2)/e^(1/2))/a^2/d/e^(5/2)-1/8/d/a^2/e^2/(e^2)^(1/4)*2^(1/2)*ln((e*co
t(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c
)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/4/d/a^2/e^2/(e^2
)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/a^
2/e^2/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)+2/3/a^2/d/e/(e*cot(d*x+c))^(3/2)-4/a^2/d/e^2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 1.01, size = 274, normalized size = 0.83

$$\frac{e\left(\frac{4\left(4\,e^{2}-\frac{20\,e^{2}}{\tan(dx+c)}-\frac{27\,e^{2}}{\tan(dx+c)^{2}}\right)}{a^{2}e^{4}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}+a^{2}e^{3}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{5}{2}}}-\frac{3\left(\frac{2\;\sqrt{2}\;\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\;\sqrt{e}+2\;\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\;\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\;\sqrt{2}\;\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\;\sqrt{e}-2\;\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\;\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\;\log\left(\sqrt{2}\;\sqrt{e}\;\sqrt{\frac{e}{\tan(dx+c)}}\cdots\right.}{\sqrt{e}}\cdots\right)}{a^{2}e^{3}}\cdots\right)}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/24*e*(4*(4*e^2 - 20*e^2/tan(d*x + c) - 27*e^2/tan(d*x + c)^2)/(a^2*e^4*(e
/tan(d*x + c))^(3/2) + a^2*e^3*(e/tan(d*x + c))^(5/2)) - 3*(2*sqrt(2)*arcta
n(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) +
 2*sqrt(2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/s
qrt(e))/sqrt(e) - sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/
tan(d*x + c))/sqrt(e) + sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) +
 e + e/tan(d*x + c))/sqrt(e))/(a^2*e^3) - 84*arctan(sqrt(e/tan(d*x + c))/sq
rt(e))/(a^2*e^(7/2)))/d
```

mupad [B] time = 1.23, size = 425, normalized size = 1.28

$$-\frac{\operatorname{atan}\left(\frac{2048\,a^{10}\,d^5\,e^{18}\,\sqrt{e\cot(c+d\,x)}\,\left(-\frac{1}{a^8\,d^4\,e^{10}}\right)^{1/4}}{2048\,a^8\,d^4\,e^{16}+100352\,a^{12}\,d^6\,e^{21}\,\sqrt{-\frac{1}{a^8\,d^4\,e^{10}}}}+\frac{100352\,a^{14}\,d^7\,e^{23}\,\sqrt{e\cot(c+d\,x)}\,\left(-\frac{1}{a^8\,d^4\,e^{10}}\right)^{3/4}}{2048\,a^8\,d^4\,e^{16}+100352\,a^{12}\,d^6\,e^{21}\,\sqrt{-\frac{1}{a^8\,d^4\,e^{10}}}}\right)\left(-\frac{1}{a^8\,d^4\,e^{10}}\right)^{1/4}}{2}-\operatorname{atan}\left(\frac{a^{10}\,d^5\,e}{2048\,a^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(5/2)*(a + a*cot(c + d*x))^2),x)
```

```
[Out] - (atan((2048*a^10*d^5*e^18*(e*cot(c + d*x))^(1/2)*(-1/(a^8*d^4*e^10))^(1/4
))/(2048*a^8*d^4*e^16 + 100352*a^12*d^6*e^21*(-1/(a^8*d^4*e^10))^(1/2)) + (
100352*a^14*d^7*e^23*(e*cot(c + d*x))^(1/2)*(-1/(a^8*d^4*e^10))^(3/4))/(204
8*a^8*d^4*e^16 + 100352*a^12*d^6*e^21*(-1/(a^8*d^4*e^10))^(1/2)))*(-1/(a^8*
d^4*e^10))^(1/4))/2 - atan((a^10*d^5*e^18*(e*cot(c + d*x))^(1/2)*(-1/(256*a
^8*d^4*e^10))^(1/4)*8192i)/(2048*a^8*d^4*e^16 - 1605632*a^12*d^6*e^21*(-1/(
256*a^8*d^4*e^10))^(1/2)) - (a^14*d^7*e^23*(e*cot(c + d*x))^(1/2)*(-1/(256*
a^8*d^4*e^10))^(3/4)*6422528i)/(2048*a^8*d^4*e^16 - 1605632*a^12*d^6*e^21*(
-1/(256*a^8*d^4*e^10))^(1/2)))*(-1/(256*a^8*d^4*e^10))^(1/4)*2i - ((10*cot(
c + d*x))/3 + (9*cot(c + d*x)^2)/2 - 2/3)/(a^2*d*(e*cot(c + d*x))^(5/2) + a
^2*d*e*(e*cot(c + d*x))^(3/2)) - (atan(((e*cot(c + d*x))^(1/2)*(-e^5)^(1/2)
*1i)/e^3)*(-e^5)^(1/2)*7i)/(2*a^2*d*e^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{(e\cot(c+dx))^{\frac{5}{2}}\cot^2(c+dx)+2(e\cot(c+dx))^{\frac{5}{2}}\cot(c+dx)+(e\cot(c+dx))^{\frac{5}{2}}}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(5/2)/(a+a*cot(d*x+c))**2,x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(5/2)*cot(c + d*x)**2 + 2*(e*cot(c + d*x))**(
5/2)*cot(c + d*x) + (e*cot(c + d*x))**(5/2)), x)/a**2
```

3.35 $\int \frac{(e\cot(c+dx))^{5/2}}{(a+a\cot(c+dx))^3}\,dx$

Optimal. Leaf size=164

$$-\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d}+\frac{e^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d}-\frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(\cot(c+dx)+1)}+\frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a\cot(c+dx)+a)^2}$$

```
[Out] -1/8*e^(5/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/d+1/4*e^(5/2)*arctanh
(1/2*(e^(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a^3/d*2^(1/
2)-5/8*e^2*(e*cot(d*x+c))^(1/2)/a^3/d/(1+cot(d*x+c))+1/4*e^2*(e*cot(d*x+c))
^(1/2)/a/d/(a+a*cot(d*x+c))^2
```

Rubi [A] time = 0.62, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {3565, 3649, 3654, 3532, 208, 3634, 63, 205}

$$-\frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(\cot(c+dx)+1)}-\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d}+\frac{e^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d}+\frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a\cot(c+dx)+a)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)/(a + a*Cot[c + d*x])^3,x]
```

```
[Out] -(e^(5/2)*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(8*a^3*d) + (e^(5/2)*ArcTan
h[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])])/(2*Sqrt
[2]*a^3*d) - (5*e^2*Sqrt[e*Cot[c + d*x]])/(8*a^3*d*(1 + Cot[c + d*x])) + (e
^2*Sqrt[e*Cot[c + d*x]])/(4*a*d*(a + a*Cot[c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3654

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (C_.)*tan[(e_.)
+ (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dis
t[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n*Simp[a*(A - C) - (A*b - b*C)*Ta
n[e + f*x], x], x], x] + Dist[(A*b^2 + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[
e + f*x])^n*(1 + Tan[e + f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a,
 b, c, d, e, f, A, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && N
eQ[c^2 + d^2, 0] &&  !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{5/2}}{(a+a\cot(c+dx))^3}\,dx = \frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} - \frac{\int \frac{-\frac{1}{2}a^2e^3+2a^2e^3\cot(c+dx)-\frac{5}{2}a^2e^3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2}\,dx}{4a^3}$$

$$= -\frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(1+\cot(c+dx))} + \frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{\int \frac{-\frac{3}{2}a^4e^4+\frac{5}{2}a^4e^4\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{8a^6e}$$

$$= -\frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(1+\cot(c+dx))} + \frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{\int \frac{-4a^5e^4+4a^5e^4\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{16a^8e} + \frac{e^3\int}{}$$

$$= -\frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(1+\cot(c+dx))} + \frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{e^3\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -c\right.}{16a^2d}$$

$$= \frac{e^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d} - \frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(1+\cot(c+dx))} + \frac{e^2\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} - \frac{e^2}{}$$

$$= -\frac{e^{5/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d} + \frac{e^{5/2}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d} - \frac{5e^2\sqrt{e\cot(c+dx)}}{8a^3d(1+\cot(c+dx))} + \frac{}{4}$$

Mathematica [A] time = 2.13, size = 192, normalized size = 1.17

$$\frac{\csc(c+dx)(e\cot(c+dx))^{5/2}(\sin(c+dx)+\cos(c+dx))^3\left(\frac{\sec^4(c+dx)(-5\sin(2(c+dx))+3\cos(2(c+dx))-3)}{(\tan(c+dx)+1)^2} - \frac{2\csc(c+dx)\sec(c+dx)}{}\right.}{16a^3d(\cot(c+dx)+1)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)/(a + a*Cot[c + d*x])^3,x]
```

```
[Out] ((e*Cot[c + d*x])^(5/2)*Csc[c + d*x]*(Cos[c + d*x] + Sin[c + d*x])^3*((-2*C
sc[c + d*x]*(ArcTan[Sqrt[Cot[c + d*x]]] + Sqrt[2]*(Log[-1 + Sqrt[2]*Sqrt[Co
t[c + d*x]] - Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c +
d*x]]))*Sec[c + d*x])/Cot[c + d*x]^(3/2) + (Sec[c + d*x]^4*(-3 + 3*Cos[2*(c
 + d*x)] - 5*Sin[2*(c + d*x)]))/(1 + Tan[c + d*x])^2))/(16*a^3*d*(1 + Cot[c
 + d*x])^3)
```

fricas [A] time = 0.47, size = 567, normalized size = 3.46

$$\left[-\frac{4\left(\sqrt{2}\,e^{2}\sin\left(2\,dx+2\,c\right)+\sqrt{2}\,e^{2}\right)\sqrt{-e}\,\arctan\left(\frac{\left(\sqrt{2}\,\cos(2\,dx+2\,c)+\sqrt{2}\,\sin(2\,dx+2\,c)+\sqrt{2}\right)\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}}{2\,(e\cos(2\,dx+2\,c)+e)}\right)-\left(e^{2}\sin\left(2\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/16*(4*(sqrt(2)*e^2*sin(2*d*x + 2*c) + sqrt(2)*e^2)*sqrt(-e)*arctan(1/2*
(sqrt(2)*cos(2*d*x + 2*c) + sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*sqrt(-e)*sq
rt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/(e*cos(2*d*x + 2*c) + e)) - (
e^2*sin(2*d*x + 2*c) + e^2)*sqrt(-e)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x
+ 2*c) - 2*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d
*x + 2*c) + e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)) - (3*e^2*cos(2*d*
x + 2*c) - 5*e^2*sin(2*d*x + 2*c) - 3*e^2)*sqrt((e*cos(2*d*x + 2*c) + e)/si
n(2*d*x + 2*c)))/(a^3*d*sin(2*d*x + 2*c) + a^3*d), -1/16*(2*(e^2*sin(2*d*x
+ 2*c) + e^2)*sqrt(e)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)
)/sqrt(e)) - 2*(sqrt(2)*e^2*sin(2*d*x + 2*c) + sqrt(2)*e^2)*sqrt(e)*log(-(s
qrt(2)*cos(2*d*x + 2*c) - sqrt(2)*sin(2*d*x + 2*c) - sqrt(2))*sqrt(e)*sqrt(
(e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)) + 2*e*sin(2*d*x + 2*c) + e) - (3
*e^2*cos(2*d*x + 2*c) - 5*e^2*sin(2*d*x + 2*c) - 3*e^2)*sqrt((e*cos(2*d*x +
 2*c) + e)/sin(2*d*x + 2*c)))/(a^3*d*sin(2*d*x + 2*c) + a^3*d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(e\cot\left(dx+c\right)\right)^{\frac{5}{2}}}{\left(a\cot\left(dx+c\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(5/2)/(a*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.83, size = 440, normalized size = 2.68

$$-\frac{5e^{3}\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{3e^{4}\sqrt{e\cot\left(dx+c\right)}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{e^{\frac{5}{2}}\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{8a^{3}d}+\frac{e^{2}\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e}}\right.}{16d\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)/(a+cot(d*x+c)*a)^3,x)
```

```
[Out] -5/8/d/a^3*e^3/(e*cot(d*x+c)+e)^2*(e*cot(d*x+c))^(3/2)-3/8/d/a^3*e^4/(e*cot
(d*x+c)+e)^2*(e*cot(d*x+c))^(1/2)-1/8*e^(5/2)*arctan((e*cot(d*x+c))^(1/2)/e
^(1/2))/a^3/d+1/16/d/a^3*e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/8/d/a^3*e^2*(e^2)^(1/4)*2^(1/2)*ar
ctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/8/d/a^3*e^2*(e^2)^(1/4)*
2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/16/d/a^3*e^3*
2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/
2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2
)^(1/2)))-1/8/d/a^3*e^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)+1/8/d/a^3*e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.46, size = 197, normalized size = 1.20

$$-\frac{e\left(\frac{3\,e^{3}\sqrt{\frac{e}{\tan(dx+c)}}+5\,e^{2}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}{a^{3}e^{2}+\frac{2\,a^{3}e^{2}}{\tan(dx+c)}+\frac{a^{3}e^{2}}{\tan(dx+c)^{2}}}-\frac{e^{2}\left(\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}\right)}{a^{3}}+\frac{e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right.}{a^{3}}\right.}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/8*e*((3*e^3*sqrt(e/tan(d*x + c)) + 5*e^2*(e/tan(d*x + c))^(3/2))/(a^3*e^
2 + 2*a^3*e^2/tan(d*x + c) + a^3*e^2/tan(d*x + c)^2) - e^2*(sqrt(2)*log(sqr
t(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*l
og(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/a^3
 + e^(3/2)*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/a^3)/d
```

mupad [B] time = 1.04, size = 154, normalized size = 0.94

$$\frac{\sqrt{2}\,e^{5/2}\,\mathrm{atanh}\left(\frac{9\,\sqrt{2}\,e^{33/2}\,\sqrt{e\cot(c+d\,x)}}{32\left(\frac{9\,e^{17}\,\cot(c+d\,x)}{32}+\frac{9\,e^{17}}{32}\right)}\right)}{4\,a^3\,d}-\frac{e^{5/2}\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{8\,a^3\,d}-\frac{\frac{3\,e^4\,\sqrt{e\cot(c+d\,x)}}{8}+\frac{5\,e^3\,(e\cot(c+d\,x))^{3/2}}{8}}{d\,a^3\,e^2\cot\left(c+d\,x\right)^2+2\,d\,a^3\,e^2\cot\left(c+d\,x\right)+d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)/(a + a*cot(c + d*x))^3,x)
```

```
[Out] (2^(1/2)*e^(5/2)*atanh((9*2^(1/2)*e^(33/2)*(e*cot(c + d*x))^(1/2))/(32*((9*
e^17*cot(c + d*x))/32 + (9*e^17)/32))))/(4*a^3*d) - (e^(5/2)*atan((e*cot(c
+ d*x))^(1/2)/e^(1/2)))/(8*a^3*d) - ((3*e^4*(e*cot(c + d*x))^(1/2))/8 + (5*
e^3*(e*cot(c + d*x))^(3/2))/8)/(a^3*d*e^2 + a^3*d*e^2*cot(c + d*x)^2 + 2*a^
3*d*e^2*cot(c + d*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\cot(c+dx))^{\frac{5}{2}}}{\cot^3(c+dx)+3\cot^2(c+dx)+3\cot(c+dx)+1}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)/(a+a*cot(d*x+c))**3,x)
```

```
[Out] Integral((e*cot(c + d*x))**(5/2)/(cot(c + d*x)**3 + 3*cot(c + d*x)**2 + 3*c
ot(c + d*x) + 1), x)/a**3
```

3.36 $\int \frac{(e\cot(c+dx))^{3/2}}{(a+a\cot(c+dx))^3}\,dx$

Optimal. Leaf size=164

$$\frac{5e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d}+\frac{e\sqrt{e\cot(c+dx)}}{8d\left(a^3\cot(c+dx)+a^3\right)}-\frac{e\sqrt{e\cot(c+dx)}}{4ad(a\cot(c+dx)+a)^2}$$

```
[Out] 5/8*e^(3/2)*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/d+1/4*e^(3/2)*arctan(1
/2*(e^(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a^3/d*2^(1/2)
-1/4*e*(e*cot(d*x+c))^(1/2)/a/d/(a+a*cot(d*x+c))^2+1/8*e*(e*cot(d*x+c))^(1/
2)/d/(a^3+a^3*cot(d*x+c))
```

Rubi [A] time = 0.66, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {3567, 3649, 3653, 3532, 205, 3634, 63}

$$\frac{5e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d}+\frac{e\sqrt{e\cot(c+dx)}}{8d\left(a^3\cot(c+dx)+a^3\right)}-\frac{e\sqrt{e\cot(c+dx)}}{4ad(a\cot(c+dx)+a)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)/(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (5*e^(3/2)*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(8*a^3*d) + (e^(3/2)*ArcTa
n[(Sqrt[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])])/(2*Sqrt
[2]*a^3*d) - (e*Sqrt[e*Cot[c + d*x]])/(4*a*d*(a + a*Cot[c + d*x])^2) + (e*S
qrt[e*Cot[c + d*x]])/(8*d*(a^3 + a^3*Cot[c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3567

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m
+ 1)*(c + d*Tan[e + f*x])^(n - 1))/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m
 + 1)*(a^2 + b^2)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(
n - 2)*Simp[a*c^2*(m + 1) + a*d^2*(n - 1) + b*c*d*(m - n + 2) - (b*c^2 - 2*
a*c*d - b*d^2)*(m + 1)*Tan[e + f*x] - d*(b*c - a*d)*(m + n)*Tan[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2
 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && LtQ[1, n, 2] && IntegerQ[2
*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
```

```
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{3/2}}{(a+a\cot(c+dx))^3}\,dx = -\frac{e\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} - \frac{\int \frac{\frac{ae^2}{2}-2ae^2\cot(c+dx)-\frac{3}{2}ae^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2}\,dx}{4a^2}$$

$$= -\frac{e\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{e\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} + \frac{\int \frac{-\frac{1}{2}a^3e^3+4a^3e^3\cot(c+dx)-\frac{1}{2}a^3e^3\cot}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx)}}{8a^5e}$$

$$= -\frac{e\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{e\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} + \frac{\int \frac{4a^4e^3+4a^4e^3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{16a^7e} - \frac{(5e}{}$$

$$= -\frac{e\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{e\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} - \frac{\left(5e^2\right)\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx,\right.}{16a^2d}$$

$$= \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d} - \frac{e\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{e\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} + \cdots$$

$$= \frac{5e^{3/2}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d} - \frac{e\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \cdots$$

Mathematica [A] time = 2.02, size = 131, normalized size = 0.80

$$\frac{e\sqrt{e\cot(c+dx)}\left(\frac{2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\cot(c+dx)}\right)-2\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\cot(c+dx)}+1\right)+5\tan^{-1}\left(\sqrt{\cot(c+dx)}\right)}{\sqrt{\cot(c+dx)}}+\frac{\tan(c+dx)-\sec^2(c+dx)+1}{(\tan(c+dx)+1)^2}\right)}{8a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)/(a + a*Cot[c + d*x])^3,x]
```

```
[Out] (e*Sqrt[e*Cot[c + d*x]]*((2*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]]
- 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 5*ArcTan[Sqrt[Cot[c +
d*x]]])/Sqrt[Cot[c + d*x]] + (1 - Sec[c + d*x]^2 + Tan[c + d*x])/(1 + Tan[c
 + d*x])^2))/(8*a^3*d)
```

fricas [A] time = 0.54, size = 533, normalized size = 3.25

$$\left[\frac{2\left(\sqrt{2}e\sin\left(2\,dx+2\,c\right)+\sqrt{2}e\right)\sqrt{-e}\,\log\left(-\left(\sqrt{2}\,\cos\left(2\,dx+2\,c\right)+\sqrt{2}\,\sin\left(2\,dx+2\,c\right)-\sqrt{2}\right)\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)}{\sin(2\,dx+2\,c)}}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [1/16*(2*(sqrt(2)*e*sin(2*d*x + 2*c) + sqrt(2)*e)*sqrt(-e)*log(-(sqrt(2)*co
s(2*d*x + 2*c) + sqrt(2)*sin(2*d*x + 2*c) - sqrt(2))*sqrt(-e)*sqrt((e*cos(2
*d*x + 2*c) + e)/sin(2*d*x + 2*c)) - 2*e*sin(2*d*x + 2*c) + e) + 5*(e*sin(2
*d*x + 2*c) + e)*sqrt(-e)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) + 2*
sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) +
 e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)) + (e*cos(2*d*x + 2*c) + e*si
n(2*d*x + 2*c) - e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(a^3*d
*sin(2*d*x + 2*c) + a^3*d), 1/16*(4*(sqrt(2)*e*sin(2*d*x + 2*c) + sqrt(2)*e
)*sqrt(e)*arctan(-1/2*(sqrt(2)*cos(2*d*x + 2*c) - sqrt(2)*sin(2*d*x + 2*c)
+ sqrt(2))*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/(e*cos(2
*d*x + 2*c) + e)) + 10*(e*sin(2*d*x + 2*c) + e)*sqrt(e)*arctan(sqrt((e*cos(
2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)) + (e*cos(2*d*x + 2*c) + e*sin(
2*d*x + 2*c) - e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(a^3*d*s
in(2*d*x + 2*c) + a^3*d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{\left(a\cot\left(dx+c\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(3/2)/(a*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.84, size = 434, normalized size = 2.65

$$\frac{e^{2}\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{e^{3}\sqrt{e\cot\left(dx+c\right)}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}+\frac{5e^{\frac{3}{2}}\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{8a^{3}d}-\frac{e\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{}}\right.}{16d\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)/(a+cot(d*x+c)*a)^3,x)
```

```
[Out] 1/8/d/a^3*e^2/(e*cot(d*x+c)+e)^2*(e*cot(d*x+c))^(3/2)-1/8/d/a^3*e^3/(e*cot(
d*x+c)+e)^2*(e*cot(d*x+c))^(1/2)+5/8*e^(3/2)*arctan((e*cot(d*x+c))^(1/2)/e^
(1/2))/a^3/d-1/16/d/a^3*e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/8/d/a^3*e*(e^2)^(1/4)*2^(1/2)*arctan(
2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/8/d/a^3*e*(e^2)^(1/4)*2^(1/2)
*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/16/d/a^3*e^2*2^(1/2)
/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2
)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
))-1/8/d/a^3*e^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)+1)+1/8/d/a^3*e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.92, size = 189, normalized size = 1.15

$$-\frac{e\left(\frac{e^{2}\sqrt{\frac{e}{\tan(dx+c)}}-e\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}{a^{3}e^{2}+\frac{2a^{3}e^{2}}{\tan(dx+c)}+\frac{a^{3}e^{2}}{\tan(dx+c)^{2}}}+\frac{2e\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{a^{3}}-\frac{5\sqrt{e}\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a^{3}}\right)}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/8*e*((e^2*sqrt(e/tan(d*x + c)) - e*(e/tan(d*x + c))^(3/2))/(a^3*e^2 + 2*
a^3*e^2/tan(d*x + c) + a^3*e^2/tan(d*x + c)^2) + 2*e*(sqrt(2)*arctan(1/2*sq
rt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)
*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sq
rt(e))/a^3 - 5*sqrt(e)*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/a^3)/d
```

mupad [B] time = 0.94, size = 178, normalized size = 1.09

$$\frac{5\,e^{3/2}\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{8\,a^3\,d}-\frac{\frac{e^3\,\sqrt{e\cot(c+d\,x)}}{8}-\frac{e^2\,(e\cot(c+d\,x))^{3/2}}{8}}{d\,a^3\,e^2\cot\left(c+d\,x\right)^2+2\,d\,a^3\,e^2\cot\left(c+d\,x\right)+d\,a^3\,e^2}-\frac{\sqrt{2}\,e^{3/2}\,\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)/(a + a*cot(c + d*x))^3,x)
```

```
[Out] (5*e^(3/2)*atan((e*cot(c + d*x))^(1/2)/e^(1/2)))/(8*a^3*d) - ((e^3*(e*cot(c
 + d*x))^(1/2))/8 - (e^2*(e*cot(c + d*x))^(3/2))/8)/(a^3*d*e^2 + a^3*d*e^2*
cot(c + d*x)^2 + 2*a^3*d*e^2*cot(c + d*x)) - (2^(1/2)*e^(3/2)*(2*atan((2^(1
/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2))) + 2*atan((2^(1/2)*(e*cot(c + d*x))
^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c + d*x))^(3/2))/(2*e^(3/2)))))/(8*a^
3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\cot(c+dx))^{\frac{3}{2}}}{\cot^3(c+dx)+3\cot^2(c+dx)+3\cot(c+dx)+1}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)/(a+a*cot(d*x+c))**3,x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)/(cot(c + d*x)**3 + 3*cot(c + d*x)**2 + 3*c
ot(c + d*x) + 1), x)/a**3
```

3.37 $\int \frac{\sqrt{e\cot(c+dx)}}{(a+a\cot(c+dx))^3}\,dx$

Optimal. Leaf size=161

$$\frac{3\sqrt{e\cot(c+dx)}}{8d\left(a^3\cot(c+dx)+a^3\right)}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d}-\frac{\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d}+\frac{\sqrt{e\cot(c+dx)}}{4ad(a\cot(c+dx)+a)^2}$$

```
[Out] -1/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/a^3/d-1/4*arctanh(1/2*(e^
(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))*e^(1/2)/a^3/d*2^(1/
2)+1/4*(e*cot(d*x+c))^(1/2)/a/d/(a+a*cot(d*x+c))^2+3/8*(e*cot(d*x+c))^(1/2)
/d/(a^3+a^3*cot(d*x+c))
```

Rubi [A] time = 0.59, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {3568, 3649, 3654, 3532, 208, 3634, 63, 205}

$$\frac{3\sqrt{e\cot(c+dx)}}{8d\left(a^3\cot(c+dx)+a^3\right)}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d}-\frac{\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d}+\frac{\sqrt{e\cot(c+dx)}}{4ad(a\cot(c+dx)+a)^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]/(a + a*Cot[c + d*x])^3,x]
```

```
[Out] -(Sqrt[e]*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(8*a^3*d) - (Sqrt[e]*ArcTan
h[(Sqrt[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])])/(2*Sqrt
[2]*a^3*d) + Sqrt[e*Cot[c + d*x]]/(4*a*d*(a + a*Cot[c + d*x])^2) + (3*Sqrt[
e*Cot[c + d*x]])/(8*d*(a^3 + a^3*Cot[c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3568

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(a + b*Tan[e + f*x])^(m + 1)*(c +
d*Tan[e + f*x])^n)/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m + 1)*(a^2 + b^2
)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n - 1)*Simp[a*c*
(m + 1) - b*d*n - (b*c - a*d)*(m + 1)*Tan[e + f*x] - b*d*(m + n + 1)*Tan[e
+ f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &
& NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && GtQ[n, 0] && Inte
gerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3654

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (C_.)*tan[(e_.)
```

```
+ (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dis
t[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n*Simp[a*(A - C) - (A*b - b*C)*Ta
n[e + f*x], x], x], x] + Dist[(A*b^2 + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[
e + f*x])^n*(1 + Tan[e + f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a,
 b, c, d, e, f, A, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && N
eQ[c^2 + d^2, 0] && !GtQ[n, 0] && !LeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{e\cot(c+dx)}}{(a+a\cot(c+dx))^3}\,dx = \frac{\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} - \frac{\int \frac{-\frac{ae}{2}-2ae\cot(c+dx)+\frac{3}{2}ae\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2}\,dx}{4a^2}$$

$$= \frac{\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{3\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} + \frac{\int \frac{\frac{5a^3e^2}{2}-\frac{3}{2}a^3e^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))}\,dx}{8a^5e}$$

$$= \frac{\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{3\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} + \frac{\int \frac{4a^4e^2-4a^4e^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{16a^7e} + \frac{e\int -$$

$$= \frac{\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{3\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)} + \frac{e\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-ax)}\,dx, x, -c\right.}{16a^2d}$$

$$= -\frac{\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d} + \frac{\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} + \frac{3\sqrt{e\cot(c+dx)}}{8d\left(a^3+a^3\cot(c+dx)\right)}$$

$$= -\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d} - \frac{\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d} + \frac{\sqrt{e\cot(c+dx)}}{4ad(a+a\cot(c+dx))^2} +$$

Mathematica [A] time = 0.82, size = 181, normalized size = 1.12

$$-\frac{\sqrt{e\cot(c+dx)}\left(\sqrt{\cot(c+dx)}\,(-3\sin(2(c+dx))+5\cos(2(c+dx))-5)+2(\sin(2(c+dx))+1)\tan^{-1}\left(\sqrt{\cot(c+\right.\right.}{16a^3d\sqrt{\cot(c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]/(a + a*Cot[c + d*x])^3,x]
```

```
[Out] -1/16*(Sqrt[e*Cot[c + d*x]]*(-2*Sqrt[2]*(Log[-1 + Sqrt[2]*Sqrt[Cot[c + d*x]
] - Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])*(Co
```

```
s[c + d*x] + Sin[c + d*x])^2 + Sqrt[Cot[c + d*x]]*(-5 + 5*Cos[2*(c + d*x)]
- 3*Sin[2*(c + d*x)]) + 2*ArcTan[Sqrt[Cot[c + d*x]]]*(1 + Sin[2*(c + d*x)])
))/(a^3*d*Sqrt[Cot[c + d*x]]*(Cos[c + d*x] + Sin[c + d*x])^2)
```

fricas [A] time = 0.53, size = 518, normalized size = 3.22

$$\left[\frac{4\left(\sqrt{2}\sin\left(2\,dx+2\,c\right)+\sqrt{2}\right)\sqrt{-e}\arctan\left(\frac{\left(\sqrt{2}\cos(2\,dx+2\,c)+\sqrt{2}\sin(2\,dx+2\,c)+\sqrt{2}\right)\sqrt{-e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}}{2\,(e\cos(2\,dx+2\,c)+e)}\right)+\sqrt{-e}\,(\sin(2\,dx}{16\,(}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [1/16*(4*(sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*sqrt(-e)*arctan(1/2*(sqrt(2)*
cos(2*d*x + 2*c) + sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*sqrt(-e)*sqrt((e*cos
(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/(e*cos(2*d*x + 2*c) + e)) + sqrt(-e)*(
sin(2*d*x + 2*c) + 1)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) - 2*sqrt
(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) + e)/
(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)) - sqrt((e*cos(2*d*x + 2*c) + e)/
sin(2*d*x + 2*c))*(5*cos(2*d*x + 2*c) - 3*sin(2*d*x + 2*c) - 5))/(a^3*d*sin
(2*d*x + 2*c) + a^3*d), -1/16*(2*sqrt(e)*(sin(2*d*x + 2*c) + 1)*arctan(sqrt
((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)) - 2*(sqrt(2)*sin(2*d*x
 + 2*c) + sqrt(2))*sqrt(e)*log((sqrt(2)*cos(2*d*x + 2*c) - sqrt(2)*sin(2*d*
x + 2*c) - sqrt(2))*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))
 + 2*e*sin(2*d*x + 2*c) + e) + sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*
c))*(5*cos(2*d*x + 2*c) - 3*sin(2*d*x + 2*c) - 5))/(a^3*d*sin(2*d*x + 2*c)
+ a^3*d)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cot\left(dx+c\right)}}{\left(a\cot\left(dx+c\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cot(d*x + c))/(a*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.86, size = 423, normalized size = 2.63

$$\frac{3e\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}+\frac{5e^{2}\sqrt{e\cot\left(dx+c\right)}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)\sqrt{e}}{8a^{3}d}-\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\ \ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot}}\right.}{16d\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)/(a+cot(d*x+c)*a)^3,x)
```

```
[Out] 3/8/d/a^3*e/(e*cot(d*x+c)+e)^2*(e*cot(d*x+c))^(3/2)+5/8/d/a^3*e^2/(e*cot(d*
x+c)+e)^2*(e*cot(d*x+c))^(1/2)-1/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))*e^(
1/2)/a^3/d-1/16/d/a^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/8/d/a^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2
)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/8/d/a^3*(e^2)^(1/4)*2^(1/2)*arctan(
-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/16/d/a^3*e*2^(1/2)/(e^2)^(1/
4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(
e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/8/d/a
^3*e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
-1/8/d/a^3*e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)+1)
```

maxima [A] time = 0.60, size = 190, normalized size = 1.18

$$\frac{e\left(\frac{5\,e\sqrt{\frac{e}{\tan(dx+c)}}+3\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}{a^{3}e^{2}+\frac{2\,a^{3}e^{2}}{\tan(dx+c)}+\frac{a^{3}e^{2}}{\tan(dx+c)^{2}}}-\frac{\frac{\sqrt{2}\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}}{a^{3}}-\frac{\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a^{3}\sqrt{e}}\right)}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*e*((5*e*sqrt(e/tan(d*x + c)) + 3*(e/tan(d*x + c))^(3/2))/(a^3*e^2 + 2*a
^3*e^2/tan(d*x + c) + a^3*e^2/tan(d*x + c)^2) - (sqrt(2)*log(sqrt(2)*sqrt(e
)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)
*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/a^3 - arctan(s
qrt(e/tan(d*x + c))/sqrt(e))/(a^3*sqrt(e)))/d
```

mupad [B] time = 0.90, size = 151, normalized size = 0.94

$$\frac{\frac{3\,e\,\left(e\,\cot(c+d\,x)\right)^{3/2}}{8}+\frac{5\,e^2\,\sqrt{e\,\cot(c+d\,x)}}{8}}{d\,a^3\,e^2\cot\left(c+d\,x\right)^2+2\,d\,a^3\,e^2\cot\left(c+d\,x\right)+d\,a^3\,e^2}-\frac{\sqrt{e}\,\,\mathrm{atan}\left(\frac{\sqrt{e\,\cot(c+d\,x)}}{\sqrt{e}}\right)}{8\,a^3\,d}-\frac{\sqrt{2}\,\sqrt{e}\,\,\mathrm{atanh}\left(\frac{9\,\sqrt{2}\,e^{17/2}\,\sqrt{e\,\cot(c+d\,x}}{32\left(\frac{9\,e^9\,\cot(c+d\,x)}{32}+\frac{9\,e^9}{32}\right)}\right.}{4\,a^3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)/(a + a*cot(c + d*x))^3,x)
```

```
[Out] ((3*e*(e*cot(c + d*x))^(3/2))/8 + (5*e^2*(e*cot(c + d*x))^(1/2))/8)/(a^3*d*
e^2 + a^3*d*e^2*cot(c + d*x)^2 + 2*a^3*d*e^2*cot(c + d*x)) - (e^(1/2)*atan(
(e*cot(c + d*x))^(1/2)/e^(1/2)))/(8*a^3*d) - (2^(1/2)*e^(1/2)*atanh((9*2^(1
/2)*e^(17/2)*(e*cot(c + d*x))^(1/2))/(32*((9*e^9*cot(c + d*x))/32 + (9*e^9)
/32))))/(4*a^3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{e\cot\left(c+dx\right)}}{\cot^3\left(c+dx\right)+3\cot^2\left(c+dx\right)+3\cot\left(c+dx\right)+1}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)/(a+a*cot(d*x+c))**3,x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))/(cot(c + d*x)**3 + 3*cot(c + d*x)**2 + 3*cot(
c + d*x) + 1), x)/a**3
```

3.38 $\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^3}\,dx$

Optimal. Leaf size=165

$$-\frac{7\sqrt{e\cot(c+dx)}}{8a^3de(\cot(c+dx)+1)}-\frac{11\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d\sqrt{e}}-\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}a^3d\sqrt{e}}-\frac{\sqrt{e\cot(c+dx)}}{4ade(a\cot(c+dx)+a)^2}$$

```
[Out] -11/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/d/e^(1/2)-1/4*arctan(1/2*(e^
(1/2)-cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a^3/d*2^(1/2)/e^(1/
2)-7/8*(e*cot(d*x+c))^(1/2)/a^3/d/e/(1+cot(d*x+c))-1/4*(e*cot(d*x+c))^(1/2)
/a/d/e/(a+a*cot(d*x+c))^2
```

Rubi [A] time = 0.65, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.280, Rules used = {3569, 3649, 3653, 3532, 205, 3634, 63}

$$-\frac{7\sqrt{e\cot(c+dx)}}{8a^3de(\cot(c+dx)+1)}-\frac{11\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d\sqrt{e}}-\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}a^3d\sqrt{e}}-\frac{\sqrt{e\cot(c+dx)}}{4ade(a\cot(c+dx)+a)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^3),x]
```

```
[Out] (-11*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(8*a^3*d*Sqrt[e]) - ArcTan[(Sqrt
[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])]/(2*Sqrt[2]*a^3*
d*Sqrt[e]) - (7*Sqrt[e*Cot[c + d*x]])/(8*a^3*d*e*(1 + Cot[c + d*x])) - Sqrt
[e*Cot[c + d*x]]/(4*a*d*e*(a + a*Cot[c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
```

```
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^3}\,dx = -\frac{\sqrt{e\cot(c+dx)}}{4ade(a+a\cot(c+dx))^2} - \frac{\int \frac{-\frac{7a^2e}{2}+2a^2e\cot(c+dx)-\frac{3}{2}a^2e\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2}\,dx}{4a^3e}$$

$$= -\frac{7\sqrt{e\cot(c+dx)}}{8a^3de(1+\cot(c+dx))} - \frac{\sqrt{e\cot(c+dx)}}{4ade(a+a\cot(c+dx))^2} + \frac{\int \frac{\frac{7a^4e^2}{2}-4a^4e^2\cot\cdots}{\sqrt{e\cot(c+\cdots}}\cdots}{\cdots}$$

$$= -\frac{7\sqrt{e\cot(c+dx)}}{8a^3de(1+\cot(c+dx))} - \frac{\sqrt{e\cot(c+dx)}}{4ade(a+a\cot(c+dx))^2} + \frac{11\int \frac{1+\cdots}{\sqrt{e\cot(c+dx)}\cdots}}{16\cdots}$$

$$= -\frac{7\sqrt{e\cot(c+dx)}}{8a^3de(1+\cot(c+dx))} - \frac{\sqrt{e\cot(c+dx)}}{4ade(a+a\cot(c+dx))^2} + \frac{11\,\mathrm{Subst}\left(\int \frac{\cdots}{\sqrt{\cdots}}\cdots\right.}{\cdots}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d\sqrt{e}} - \frac{7\sqrt{e\cot(c+dx)}}{8a^3de(1+\cot(c+dx))} - \frac{\sqrt{e\cot(c+\cdots}}{4ade(a+a\cot(c\cdots}$$

$$= -\frac{11\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3d\sqrt{e}} - \frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3d\sqrt{e}} - \frac{7\sqrt{e\cot(c+d\cdots}}{8a^3de(1+\cot(c+\cdots}$$

Mathematica [A] time = 1.27, size = 217, normalized size = 1.32

$$\frac{\sqrt{\cot(c+dx)}\left(-9\sqrt{\cot(c+dx)}+9\cos(2(c+dx))\sqrt{\cot(c+dx)}-7\sin(2(c+dx))\sqrt{\cot(c+dx)}-22\tan^{-1}\left(\sqrt{\cot\cdots}\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cot[c + d*x]]*(a + a*Cot[c + d*x])^3),x]
```

```
[Out] (Sqrt[Cot[c + d*x]]*(-22*ArcTan[Sqrt[Cot[c + d*x]]] - 9*Sqrt[Cot[c + d*x]]
+ 9*Cos[2*(c + d*x)]*Sqrt[Cot[c + d*x]] - 4*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt
[Cot[c + d*x]]]*(Cos[c + d*x] + Sin[c + d*x])^2 + 4*Sqrt[2]*ArcTan[1 + Sqrt
[2]*Sqrt[Cot[c + d*x]]]*(Cos[c + d*x] + Sin[c + d*x])^2 - 22*ArcTan[Sqrt[Co
t[c + d*x]]]*Sin[2*(c + d*x)] - 7*Sqrt[Cot[c + d*x]]*Sin[2*(c + d*x)]))/(16
*a^3*d*Sqrt[e*Cot[c + d*x]]*(Cos[c + d*x] + Sin[c + d*x])^2)
```

fricas [A] time = 0.45, size = 504, normalized size = 3.05

$$\left[-\frac{2\sqrt{2}\sqrt{-e}\left(\sin\left(2\,dx+2\,c\right)+1\right)\log\left(-\sqrt{2}\sqrt{-e}\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\left(\cos\left(2\,dx+2\,c\right)+\sin\left(2\,dx+2\,c\right)-1\right)-2\,e\sin\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^3,x, algorithm="fricas")

[Out] [-1/16*(2*sqrt(2)*sqrt(-e)*(sin(2*d*x + 2*c) + 1)*log(-sqrt(2)*sqrt(-e)*sqr t((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) - 1) - 2*e*sin(2*d*x + 2*c) + e) + 11*sqrt(-e)*(sin(2*d*x + 2*c) + 1)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) + 2*sqrt(-e)*sqrt((e*cos(2*d *x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) + e)/(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)) - sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(9 *cos(2*d*x + 2*c) - 7*sin(2*d*x + 2*c) - 9))/(a^3*d*e*sin(2*d*x + 2*c) + a^ 3*d*e), -1/16*(4*sqrt(2)*sqrt(e)*(sin(2*d*x + 2*c) + 1)*arctan(-1/2*sqrt(2) *sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x + 2*c) + e)) + 22*sqrt(e)*(sin(2*d*x + 2*c) + 1)*arctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)) - sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(9*cos(2*d*x + 2*c) - 7*s in(2*d*x + 2*c) - 9))/(a^3*d*e*sin(2*d*x + 2*c) + a^3*d*e)]

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a\cot\left(dx+c\right)+a\right)^{3}\sqrt{e\cot\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^3,x, algorithm="giac")

[Out] integrate(1/((a*cot(d*x + c) + a)^3*sqrt(e*cot(d*x + c))), x)

maple [B] time = 0.83, size = 426, normalized size = 2.58

$$-\frac{7\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{9e\sqrt{e\cot\left(dx+c\right)}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{11\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{8a^{3}d\sqrt{e}}+\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cdots}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cdots}}\right.}{16d\,a^{3}e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(1/2)/(a+cot(d*x+c)*a)^3,x)
```

```
[Out] -7/8/d/a^3/(e*cot(d*x+c)+e)^2*(e*cot(d*x+c))^(3/2)-9/8/d/a^3*e/(e*cot(d*x+c
)+e)^2*(e*cot(d*x+c))^(1/2)-11/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/d
/e^(1/2)+1/16/d/a^3/e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/8/d/a^3/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1
/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/8/d/a^3/e*(e^2)^(1/4)*2^(1/2)*arc
tan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/16/d/a^3*2^(1/2)/(e^2)^(
1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/8/d
/a^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
-1/8/d/a^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)
```

maxima [A] time = 0.51, size = 189, normalized size = 1.15

$$-\frac{e\left(\frac{9\,e\sqrt{\frac{e}{\tan(dx+c)}}+7\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}{a^3e^3+\frac{2\,a^3e^3}{\tan(dx+c)}+\frac{a^3e^3}{\tan(dx+c)^2}}-\frac{2\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{a^3e}+\frac{11\arctan\left(\frac{\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{e}}\right)}{a^3e^{\frac{3}{2}}}\right)}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/8*e*((9*e*sqrt(e/tan(d*x + c)) + 7*(e/tan(d*x + c))^(3/2))/(a^3*e^3 + 2*
a^3*e^3/tan(d*x + c) + a^3*e^3/tan(d*x + c)^2) - 2*(sqrt(2)*arctan(1/2*sqrt
(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*a
rctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt
(e))/(a^3*e) + 11*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/(a^3*e^(3/2)))/d
```

mupad [B] time = 0.94, size = 173, normalized size = 1.05

$$\frac{\sqrt{2}\,\left(2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}\right)+2\,\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{e\cot(c+d\,x)}}{2\,\sqrt{e}}+\frac{\sqrt{2}\,(e\cot(c+d\,x))^{3/2}}{2\,e^{3/2}}\right)\right)}{8\,a^3\,d\,\sqrt{e}}-\frac{11\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{8\,a^3\,d\,\sqrt{e}}-\frac{9\,e\,\cdots}{d\,a^3\,e^2\cot(c+\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(1/2)*(a + a*cot(c + d*x))^3),x)
```

```
[Out] (2^(1/2)*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2))) + 2*atan((2^
(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (2^(1/2)*(e*cot(c + d*x))^(3/2)
)/(2*e^(3/2)))))/(8*a^3*d*e^(1/2)) - (11*atan((e*cot(c + d*x))^(1/2)/e^(1/2
)))/(8*a^3*d*e^(1/2)) - ((9*e*(e*cot(c + d*x))^(1/2))/8 + (7*(e*cot(c + d*x
))^(3/2))/8)/(a^3*d*e^2 + a^3*d*e^2*cot(c + d*x)^2 + 2*a^3*d*e^2*cot(c + d*
x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{\sqrt{e\cot(c+dx)}\cot^3(c+dx)+3\sqrt{e\cot(c+dx)}\cot^2(c+dx)+3\sqrt{e\cot(c+dx)}\cot(c+dx)+\sqrt{e\cot(c+dx)}}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(1/2)/(a+a*cot(d*x+c))**3,x)
```

```
[Out] Integral(1/(sqrt(e*cot(c + d*x))*cot(c + d*x)**3 + 3*sqrt(e*cot(c + d*x))*c
ot(c + d*x)**2 + 3*sqrt(e*cot(c + d*x))*cot(c + d*x) + sqrt(e*cot(c + d*x))
), x)/a**3
```

3.39 $\int \frac{1}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^3}\,dx$

Optimal. Leaf size=189

$$\frac{31\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3de^{3/2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3de^{3/2}}+\frac{27}{8a^3de\sqrt{e\cot(c+dx)}}-\frac{9}{8a^3de(\cot(c+dx)+1)\sqrt{e\cot(c+dx)}}-$$

```
[Out] 31/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/d/e^(3/2)+1/4*arctanh(1/2*(e^
(1/2)+cot(d*x+c)*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a^3/d/e^(3/2)*2^(1/
2)+27/8/a^3/d/e/(e*cot(d*x+c))^(1/2)-9/8/a^3/d/e/(1+cot(d*x+c))/(e*cot(d*x+
c))^(1/2)-1/4/a/d/e/(a+a*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.86, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {3569, 3649, 3654, 3532, 208, 3634, 63, 205}

$$\frac{31\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3de^{3/2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{e}\cot(c+dx)+\sqrt{e}}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3de^{3/2}}+\frac{27}{8a^3de\sqrt{e\cot(c+dx)}}-\frac{9}{8a^3de(\cot(c+dx)+1)\sqrt{e\cot(c+dx)}}-$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^3),x]
```

```
[Out] (31*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(8*a^3*d*e^(3/2)) + ArcTanh[(Sqrt
[e] + Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])]/(2*Sqrt[2]*a^3*
d*e^(3/2)) + 27/(8*a^3*d*e*Sqrt[e*Cot[c + d*x]]) - 9/(8*a^3*d*e*Sqrt[e*Cot[
c + d*x]]*(1 + Cot[c + d*x])) - 1/(4*a*d*e*Sqrt[e*Cot[c + d*x]]*(a + a*Cot[
c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3654

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (C_.)*tan[(e_.)
+ (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dis
t[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n*Simp[a*(A - C) - (A*b - b*C)*Ta
n[e + f*x], x], x], x] + Dist[(A*b^2 + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[
e + f*x])^n*(1 + Tan[e + f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a,
 b, c, d, e, f, A, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && N
eQ[c^2 + d^2, 0] &&  !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^3}\,dx = -\frac{1}{4ade\sqrt{e\cot(c+dx)}\,(a+a\cot(c+dx))^2} - \frac{\int \frac{-\frac{9a^2e}{2}+2a^2e\cot(c+dx)-\frac{5}{2}a^2e}{(e\cot(c+dx))^{3/2}(a+a\cot(}}{4a^3e}$$

$$= -\frac{9}{8a^3de\sqrt{e\cot(c+dx)}\,(1+\cot(c+dx))} - \frac{1}{4ade\sqrt{e\cot(c+dx)}\,(a+a}$$

$$= \frac{27}{8a^3de\sqrt{e\cot(c+dx)}} - \frac{9}{8a^3de\sqrt{e\cot(c+dx)}\,(1+\cot(c+dx))} - \frac{}{4ad}$$

$$= \frac{27}{8a^3de\sqrt{e\cot(c+dx)}} - \frac{9}{8a^3de\sqrt{e\cot(c+dx)}\,(1+\cot(c+dx))} - \frac{}{4ad}$$

$$= \frac{27}{8a^3de\sqrt{e\cot(c+dx)}} - \frac{9}{8a^3de\sqrt{e\cot(c+dx)}\,(1+\cot(c+dx))} - \frac{}{4ad}$$

$$= \frac{\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3de^{3/2}} + \frac{27}{8a^3de\sqrt{e\cot(c+dx)}} - \frac{}{8a^3de\sqrt{e\cot(c+}}$$

$$= \frac{31\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3de^{3/2}} + \frac{\tanh^{-1}\left(\frac{\sqrt{e}+\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}\,a^3de^{3/2}} + \frac{27}{8a^3de\sqrt{e\cot(c}}$$

Mathematica [A] time = 1.21, size = 156, normalized size = 0.83

$$\frac{\cot^{\frac{3}{2}}(c+dx)\left(-2\sqrt{2}\left(\log\left(-\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}-1\right)-\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+1\right)\right)+6}{16a^3d(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*x])^3),x]
```

```
[Out] (Cot[c + d*x]^(3/2)*(62*ArcTan[Sqrt[Cot[c + d*x]]] - 2*Sqrt[2]*(Log[-1 + Sq
rt[2]*Sqrt[Cot[c + d*x]] - Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x
]] + Cot[c + d*x]]) + (43 + 11*Cos[2*(c + d*x)] + 45*Sin[2*(c + d*x)])/(Sqr
t[Cot[c + d*x]]*(Cos[c + d*x] + Sin[c + d*x])^2)))/(16*a^3*d*(e*Cot[c + d*x
])^(3/2))
```

fricas [B] time = 0.66, size = 697, normalized size = 3.69

$$\left[-\frac{4\sqrt{2}\left(\left(\cos\left(2\,dx+2\,c\right)+1\right)\sin\left(2\,dx+2\,c\right)+\cos\left(2\,dx+2\,c\right)+1\right)\sqrt{-e}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos(2\,dx+2\,c}{2\,(e\cos(2\,dx+2\,c)+e)}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/16*(4*sqrt(2)*((cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*
c) + 1)*sqrt(-e)*arctan(1/2*sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/
sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x +
2*c) + e)) + 31*((cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c)
 + 1)*sqrt(-e)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) - 2*sqrt(-e)*sq
rt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) + e)/(cos(2*
d*x + 2*c) + sin(2*d*x + 2*c) + 1)) + (45*cos(2*d*x + 2*c)^2 - (11*cos(2*d*
x + 2*c) + 43)*sin(2*d*x + 2*c) - 45)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d
*x + 2*c)))/(a^3*d*e^2*cos(2*d*x + 2*c) + a^3*d*e^2 + (a^3*d*e^2*cos(2*d*x
+ 2*c) + a^3*d*e^2)*sin(2*d*x + 2*c)), 1/16*(2*sqrt(2)*((cos(2*d*x + 2*c) +
 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c) + 1)*sqrt(e)*log(-sqrt(2)*sqrt(e)*s
qrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*(cos(2*d*x + 2*c) - sin(2*d*
x + 2*c) - 1) + 2*e*sin(2*d*x + 2*c) + e) + 62*((cos(2*d*x + 2*c) + 1)*sin(
2*d*x + 2*c) + cos(2*d*x + 2*c) + 1)*sqrt(e)*arctan(sqrt((e*cos(2*d*x + 2*c
) + e)/sin(2*d*x + 2*c))/sqrt(e)) - (45*cos(2*d*x + 2*c)^2 - (11*cos(2*d*x
+ 2*c) + 43)*sin(2*d*x + 2*c) - 45)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x
 + 2*c)))/(a^3*d*e^2*cos(2*d*x + 2*c) + a^3*d*e^2 + (a^3*d*e^2*cos(2*d*x +
2*c) + a^3*d*e^2)*sin(2*d*x + 2*c))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a\cot\left(dx+c\right)+a\right)^{3}\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)^3*(e*cot(d*x + c))^(3/2)), x)
```

maple [B] time = 0.80, size = 458, normalized size = 2.42

$$\frac{11\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{8d\,a^{3}e\left(e\cot\left(dx+c\right)+e\right)^{2}}+\frac{13\sqrt{e\cot\left(dx+c\right)}}{8d\,a^{3}\left(e\cot\left(dx+c\right)+e\right)^{2}}+\frac{31\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{8a^{3}d\,e^{\frac{3}{2}}}+\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot}}\right.}{16d\,a^{3}e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(3/2)/(a+cot(d*x+c)*a)^3,x)
```

```
[Out] 11/8/d/a^3/e/(e*cot(d*x+c)+e)^2*(e*cot(d*x+c))^(3/2)+13/8/d/a^3/(e*cot(d*x+
c)+e)^2*(e*cot(d*x+c))^(1/2)+31/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/
d/e^(3/2)+1/16/d/a^3/e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/8/d/a^3/e^2*(e^2)^(1/4)*2^(1/2)*arctan
(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/8/d/a^3/e^2*(e^2)^(1/4)*2^(1
/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/16/d/a^3/e*2^(1/2
)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
)))-1/8/d/a^3/e*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)+1)+1/8/d/a^3/e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)+1)+2/a^3/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.71, size = 214, normalized size = 1.13

$$\frac{e\left(\frac{16\,e^{2}+\frac{45\,e^{2}}{\tan(dx+c)}+\frac{27\,e^{2}}{\tan(dx+c)^{2}}}{a^{3}e^{4}\sqrt{\frac{e}{\tan(dx+c)}}+2\,a^{3}e^{3}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}+a^{3}e^{2}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{5}{2}}}+\frac{\frac{\sqrt{2}\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}\log\left(-\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}}{a^{3}e^{2}}+\frac{31}{\cdots}\right.}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*e*((16*e^2 + 45*e^2/tan(d*x + c) + 27*e^2/tan(d*x + c)^2)/(a^3*e^4*sqrt
(e/tan(d*x + c)) + 2*a^3*e^3*(e/tan(d*x + c))^(3/2) + a^3*e^2*(e/tan(d*x +
c))^(5/2)) + (sqrt(2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(
d*x + c))/sqrt(e) - sqrt(2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e +
```

```
e/tan(d*x + c))/sqrt(e))/(a^3*e^2) + 31*arctan(sqrt(e/tan(d*x + c))/sqrt(e
))/(a^3*e^(5/2)))/d
```

mupad [B] time = 1.14, size = 175, normalized size = 0.93

$$\frac{\frac{27\,e\cot(c+d\,x)^2}{8}+\frac{45\,e\cot(c+d\,x)}{8}+2\,e}{a^3\,d\,(e\cot(c+d\,x))^{5/2}+2\,a^3\,d\,e\,(e\cot(c+d\,x))^{3/2}+a^3\,d\,e^2\,\sqrt{e\cot(c+d\,x)}}+\frac{31\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{8\,a^3\,d\,e^{3/2}}+\frac{\sqrt{2}\,\mathrm{atanh}\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(3/2)*(a + a*cot(c + d*x))^3),x)
```

```
[Out] (2*e + (45*e*cot(c + d*x))/8 + (27*e*cot(c + d*x)^2)/8)/(a^3*d*(e*cot(c + d
*x))^(5/2) + 2*a^3*d*e*(e*cot(c + d*x))^(3/2) + a^3*d*e^2*(e*cot(c + d*x))^
(1/2)) + (31*atan((e*cot(c + d*x))^(1/2)/e^(1/2)))/(8*a^3*d*e^(3/2)) + (2^(
1/2)*atanh((63504384*2^(1/2)*a^9*d^3*e^(15/2)*(e*cot(c + d*x))^(1/2))/(6350
4384*a^9*d^3*e^8 + 63504384*a^9*d^3*e^8*cot(c + d*x))))/(4*a^3*d*e^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{(e\cot(c+dx))^{\frac{3}{2}}\cot^3(c+dx)+3(e\cot(c+dx))^{\frac{3}{2}}\cot^2(c+dx)+3(e\cot(c+dx))^{\frac{3}{2}}\cot(c+dx)+(e\cot(c+dx))^{\frac{3}{2}}}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(3/2)/(a+a*cot(d*x+c))**3,x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(3/2)*cot(c + d*x)**3 + 3*(e*cot(c + d*x))**(
3/2)*cot(c + d*x)**2 + 3*(e*cot(c + d*x))**(3/2)*cot(c + d*x) + (e*cot(c +
d*x))**(3/2)), x)/a**3
```

3.40 $\int \frac{1}{(e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^3}\,dx$

Optimal. Leaf size=215

$$-\frac{59\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3de^{5/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}a^3de^{5/2}}-\frac{63}{8a^3de^2\sqrt{e\cot(c+dx)}}-\frac{11}{8a^3de(\cot(c+dx)+1)(e\cot(c+dx))^{3/2}}$$

```
[Out] -59/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))/a^3/d/e^(5/2)+55/24/a^3/d/e/(e*c
ot(d*x+c))^(3/2)-11/8/a^3/d/e/(e*cot(d*x+c))^(3/2)/(1+cot(d*x+c))-1/4/a/d/e
/(e*cot(d*x+c))^(3/2)/(a+a*cot(d*x+c))^2+1/4*arctan(1/2*(e^(1/2)-cot(d*x+c)
*e^(1/2))*2^(1/2)/(e*cot(d*x+c))^(1/2))/a^3/d/e^(5/2)*2^(1/2)-63/8/a^3/d/e^
2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 1.10, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {3569, 3649, 3650, 3653, 3532, 205, 3634, 63}

$$-\frac{63}{8a^3de^2\sqrt{e\cot(c+dx)}}-\frac{59\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3de^{5/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}a^3de^{5/2}}-\frac{11}{8a^3de(\cot(c+dx)+1)(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3),x]
```

```
[Out] (-59*ArcTan[Sqrt[e*Cot[c + d*x]]/Sqrt[e]])/(8*a^3*d*e^(5/2)) + ArcTan[(Sqrt
[e] - Sqrt[e]*Cot[c + d*x])/(Sqrt[2]*Sqrt[e*Cot[c + d*x]])]/(2*Sqrt[2]*a^3*
d*e^(5/2)) + 55/(24*a^3*d*e*(e*Cot[c + d*x])^(3/2)) - 63/(8*a^3*d*e^2*Sqrt[
e*Cot[c + d*x]]) - 11/(8*a^3*d*e*(e*Cot[c + d*x])^(3/2)*(1 + Cot[c + d*x]))
 - 1/(4*a*d*e*(e*Cot[c + d*x])^(3/2)*(a + a*Cot[c + d*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 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 3532

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*c*d + b*x^2), x], x, (c -
 d*Tan[e + f*x])/Sqrt[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] &&
EqQ[c^2 - d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3650

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
Simp[((A*b^2 + a^2*C)*(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n
```

```
+ 1))/(f*(m + 1)*(b*c - a*d)*(a^2 + b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)
*(a^2 + b^2)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp
[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2)) - a*C*(b*c*(m + 1) + a*d*(n
+ 1)) - (m + 1)*(b*c - a*d)*(A*b - b*C)*Tan[e + f*x] - d*(A*b^2 + a^2*C)*(m
 + n + 2)*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, C, n},
x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m,
 -1] &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{5/2}(a+a\cot(c+dx))^3}\,dx = -\frac{1}{4ade(e\cot(c+dx))^{3/2}(a+a\cot(c+dx))^2} - \frac{\int \frac{-\frac{11a^2e}{2}+2a^2e\cot(c+dx)\cdots}{(e\cot(c+dx))^{5/2}(a+\cdots}}{4a^3e\cdots}$$

$$= -\frac{11}{8a^3de(e\cot(c+dx))^{3/2}(1+\cot(c+dx))} - \frac{1}{4ade(e\cot(c+dx))^{3/2}(\cdots}$$

$$= \frac{55}{24a^3de(e\cot(c+dx))^{3/2}} - \frac{11}{8a^3de(e\cot(c+dx))^{3/2}(1+\cot(c+dx))}\cdots$$

$$= \frac{55}{24a^3de(e\cot(c+dx))^{3/2}} - \frac{63}{8a^3de^2\sqrt{e\cot(c+dx)}} - \frac{\cdots}{8a^3de(e\cot(c\cdots}$$

$$= \frac{55}{24a^3de(e\cot(c+dx))^{3/2}} - \frac{63}{8a^3de^2\sqrt{e\cot(c+dx)}} - \frac{\cdots}{8a^3de(e\cot(c\cdots}$$

$$= \frac{55}{24a^3de(e\cot(c+dx))^{3/2}} - \frac{63}{8a^3de^2\sqrt{e\cot(c+dx)}} - \frac{\cdots}{8a^3de(e\cot(c\cdots}$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}a^3de^{5/2}} + \frac{55}{24a^3de(e\cot(c+dx))^{3/2}} - \frac{63}{8a^3de^2\sqrt{e\cot\cdots}}$$

$$= -\frac{59\tan^{-1}\left(\frac{\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{8a^3de^{5/2}} + \frac{\tan^{-1}\left(\frac{\sqrt{e}-\sqrt{e}\cot(c+dx)}{\sqrt{2}\sqrt{e\cot(c+dx)}}\right)}{2\sqrt{2}a^3de^{5/2}} + \frac{55}{24a^3de(e\cot(\cdots}$$

Mathematica [A] time = 3.19, size = 167, normalized size = 0.78

$$\frac{\cot^{\frac{5}{2}}(c+dx)\left(4\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\cot(c+dx)}\right)-4\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-118\tan^{-1}\left(\sqrt{\cot(c+dx}\cdots\right.\right.}{16a^3d(e\cot(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(5/2)*(a + a*Cot[c + d*x])^3),x]
```

```
[Out] (Cot[c + d*x]^(5/2)*(4*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 4*S
qrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] - 118*ArcTan[Sqrt[Cot[c + d*x
]]] - (Sqrt[Cot[c + d*x]]*(614 + 678*Cos[2*(c + d*x)] + 679*Cot[c + d*x] +
77*Cos[3*(c + d*x)]*Csc[c + d*x])*Sec[c + d*x]^2)/(6*(1 + Cot[c + d*x])^2))
)/(16*a^3*d*(e*Cot[c + d*x])^(5/2))
```

fricas [A] time = 0.48, size = 718, normalized size = 3.34

$$\left[-\frac{6\sqrt{2}\left(\left(\cos\left(2\,dx+2\,c\right)+1\right)\sin\left(2\,dx+2\,c\right)+\cos\left(2\,dx+2\,c\right)+1\right)\sqrt{-e}\,\log\left(\sqrt{2}\,\sqrt{-e}\,\sqrt{\frac{e\cos(2\,dx+2\,c)+e}{\sin(2\,dx+2\,c)}}\,(\cos\left(2\,dx\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] [-1/48*(6*sqrt(2)*((cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*
c) + 1)*sqrt(-e)*log(sqrt(2)*sqrt(-e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d
*x + 2*c))*(cos(2*d*x + 2*c) + sin(2*d*x + 2*c) - 1) - 2*e*sin(2*d*x + 2*c)
 + e) + 177*((cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c) + 1
)*sqrt(-e)*log((e*cos(2*d*x + 2*c) - e*sin(2*d*x + 2*c) + 2*sqrt(-e)*sqrt((
e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))*sin(2*d*x + 2*c) + e)/(cos(2*d*x
+ 2*c) + sin(2*d*x + 2*c) + 1)) - (339*cos(2*d*x + 2*c)^2 - 7*(11*cos(2*d*x
 + 2*c) + 43)*sin(2*d*x + 2*c) - 32*cos(2*d*x + 2*c) - 307)*sqrt((e*cos(2*d
*x + 2*c) + e)/sin(2*d*x + 2*c)))/(a^3*d*e^3*cos(2*d*x + 2*c) + a^3*d*e^3 +
 (a^3*d*e^3*cos(2*d*x + 2*c) + a^3*d*e^3)*sin(2*d*x + 2*c)), 1/48*(12*sqrt(
2)*((cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c) + 1)*sqrt(e)
*arctan(-1/2*sqrt(2)*sqrt(e)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)
)*(cos(2*d*x + 2*c) - sin(2*d*x + 2*c) + 1)/(e*cos(2*d*x + 2*c) + e)) - 354
*((cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c) + cos(2*d*x + 2*c) + 1)*sqrt(e)*a
rctan(sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c))/sqrt(e)) + (339*cos(2
*d*x + 2*c)^2 - 7*(11*cos(2*d*x + 2*c) + 43)*sin(2*d*x + 2*c) - 32*cos(2*d*
x + 2*c) - 307)*sqrt((e*cos(2*d*x + 2*c) + e)/sin(2*d*x + 2*c)))/(a^3*d*e^3
*cos(2*d*x + 2*c) + a^3*d*e^3 + (a^3*d*e^3*cos(2*d*x + 2*c) + a^3*d*e^3)*si
n(2*d*x + 2*c))]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a\cot\left(dx+c\right)+a\right)^{3}\left(e\cot\left(dx+c\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((a*cot(d*x + c) + a)^3*(e*cot(d*x + c))^(5/2)), x)
```

maple [B] time = 0.86, size = 482, normalized size = 2.24

$$-\frac{15\left(e\cot\left(dx+c\right)\right)^{\frac{3}{2}}}{8d\,a^{3}e^{2}\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{17\sqrt{e\cot\left(dx+c\right)}}{8d\,a^{3}e\left(e\cot\left(dx+c\right)+e\right)^{2}}-\frac{59\arctan\left(\frac{\sqrt{e\cot(dx+c)}}{\sqrt{e}}\right)}{8a^{3}d\,e^{\frac{5}{2}}}-\frac{\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}}\right.}{16d\,a^{3}e^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(5/2)/(a+cot(d*x+c)*a)^3,x)
```

```
[Out] -15/8/d/a^3/e^2/(e*cot(d*x+c)+e)^2*(e*cot(d*x+c))^(3/2)-17/8/d/a^3/e/(e*cot
(d*x+c)+e)^2*(e*cot(d*x+c))^(1/2)-59/8*arctan((e*cot(d*x+c))^(1/2)/e^(1/2))
/a^3/d/e^(5/2)-1/16/d/a^3/e^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/8/d/a^3/e^3*(e^2)^(1/4)*2^(1/2)*a
rctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/8/d/a^3/e^3*(e^2)^(1/4)
*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/16/d/a^3/e^2
*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1
/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2)))-1/8/d/a^3/e^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)+1)+1/8/d/a^3/e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/3/a^3/d/e/(e*cot(d*x+c))^(3/2)-6/a^3/d/e^
2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.78, size = 224, normalized size = 1.04

$$\frac{e\left(\frac{16\,e^{3}-\frac{112\,e^{3}}{\tan(dx+c)}-\frac{323\,e^{3}}{\tan(dx+c)^{2}}-\frac{189\,e^{3}}{\tan(dx+c)^{3}}}{a^{3}e^{5}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}+2\,a^{3}e^{4}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{5}{2}}+a^{3}e^{3}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{7}{2}}}-\frac{6\left(\frac{\sqrt{2}\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right)}{a^{3}e^{3}}-\cdots\right.}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+a*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/24*e*((16*e^3 - 112*e^3/tan(d*x + c) - 323*e^3/tan(d*x + c)^2 - 189*e^3/t
an(d*x + c)^3)/(a^3*e^5*(e/tan(d*x + c))^(3/2) + 2*a^3*e^4*(e/tan(d*x + c))
```

```
^(5/2) + a^3*e^3*(e/tan(d*x + c))^(7/2)) - 6*(sqrt(2)*arctan(1/2*sqrt(2)*(s
qrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*arctan(
-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e))/(
a^3*e^3) - 177*arctan(sqrt(e/tan(d*x + c))/sqrt(e))/(a^3*e^(7/2)))/d
```

mupad [B] time = 1.38, size = 193, normalized size = 0.90

$$-\frac{\frac{63\,e\cot(c+d\,x)^3}{8}+\frac{323\,e\cot(c+d\,x)^2}{24}+\frac{14\,e\cot(c+d\,x)}{3}-\frac{2\,e}{3}}{a^3\,d\,(e\cot(c+d\,x))^{7/2}+2\,a^3\,d\,e\,(e\cot(c+d\,x))^{5/2}+a^3\,d\,e^2\,(e\cot(c+d\,x))^{3/2}}-\frac{59\,\mathrm{atan}\left(\frac{\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{8\,a^3\,d\,e^{5/2}}-\frac{\sqrt{2}\,\left(2\,\mathrm{at}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(5/2)*(a + a*cot(c + d*x))^3),x)
```

```
[Out] - ((14*e*cot(c + d*x))/3 - (2*e)/3 + (323*e*cot(c + d*x)^2)/24 + (63*e*cot(
c + d*x)^3)/8)/(a^3*d*(e*cot(c + d*x))^(7/2) + 2*a^3*d*e*(e*cot(c + d*x))^(
5/2) + a^3*d*e^2*(e*cot(c + d*x))^(3/2)) - (59*atan((e*cot(c + d*x))^(1/2)/
e^(1/2)))/(8*a^3*d*e^(5/2)) - (2^(1/2)*(2*atan((2^(1/2)*(e*cot(c + d*x))^(1
/2))/(2*e^(1/2))) + 2*atan((2^(1/2)*(e*cot(c + d*x))^(1/2))/(2*e^(1/2)) + (
2^(1/2)*(e*cot(c + d*x))^(3/2))/(2*e^(3/2)))))/(8*a^3*d*e^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{(e\cot(c+dx))^{\frac{5}{2}}\cot^3(c+dx)+3(e\cot(c+dx))^{\frac{5}{2}}\cot^2(c+dx)+3(e\cot(c+dx))^{\frac{5}{2}}\cot(c+dx)+(e\cot(c+dx))^{\frac{5}{2}}}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(5/2)/(a+a*cot(d*x+c))**3,x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(5/2)*cot(c + d*x)**3 + 3*(e*cot(c + d*x))**(
5/2)*cot(c + d*x)**2 + 3*(e*cot(c + d*x))**(5/2)*cot(c + d*x) + (e*cot(c +
d*x))**(5/2)), x)/a**3
```

3.41 $\int \cot^2(x)\sqrt{1+\cot(x)}\,dx$

Optimal. Leaf size=223

$$-\frac{2}{3}(\cot(x)+1)^{3/2}+\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{2\sqrt{2\left(1+\sqrt{2}\right)}}-\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}\right.}{2\sqrt{2\left(1+\sqrt{2}\right)}}$$

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

Rubi [A] time = 0.27, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.692, Rules used = {3543, 3485, 700, 1127, 1161, 618, 204, 1164, 628}

$$-\frac{2}{3}(\cot(x)+1)^{3/2}+\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{2\sqrt{2\left(1+\sqrt{2}\right)}}-\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}\right.}{2\sqrt{2\left(1+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]^2*Sqrt[1 + Cot[x]],x]
```

```
[Out] -(Sqrt[(1 + Sqrt[2])/2]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] - 2*Sqrt[1 + Cot[x]])
/Sqrt[2*(-1 + Sqrt[2])]]) + Sqrt[(1 + Sqrt[2])/2]*ArcTan[(Sqrt[2*(1 + Sqrt[
2])] + 2*Sqrt[1 + Cot[x]])/Sqrt[2*(-1 + Sqrt[2])]] - (2*(1 + Cot[x])^(3/2))
/3 + Log[1 + Sqrt[2] + Cot[x] - Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 + Cot[x]]]/(2*
Sqrt[2*(1 + Sqrt[2])]) - Log[1 + Sqrt[2] + Cot[x] + Sqrt[2*(1 + Sqrt[2])]*S
qrt[1 + Cot[x]]]/(2*Sqrt[2*(1 + Sqrt[2])])
```

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 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 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 700

```
Int[Sqrt[(d_) + (e_.)*(x_)]/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[2*e, S
ubst[Int[x^2/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x]
 /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1127

```
Int[(x_)^2/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a/c, 2]}, Dist[1/2, Int[(q + x^2)/(a + b*x^2 + c*x^4), x], x] - Dist[1/2, I
nt[(q - x^2)/(a + b*x^2 + c*x^4), x], x]] /; FreeQ[{a, b, c}, x] && LtQ[b^2
 - 4*a*c, 0] && PosQ[a*c]
```

Rule 1161

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[(2*d)/e - b/c, 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]] /; Fre
eQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[c*d^2 - a*e^2, 0] && (
GtQ[(2*d)/e - b/c, 0] || ( !LtQ[(2*d)/e - b/c, 0] && EqQ[d - e*Rt[a/c, 2],
0]))
```

Rule 1164

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[(-2*d)/e - b/c, 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]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[c
*d^2 - a*e^2, 0] &&  !GtQ[b^2 - 4*a*c, 0]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
```

```
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

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

Mathematica [C] time = 0.17, size = 69, normalized size = 0.31

$$-\frac{2}{3}(\cot(x)+1)^{3/2} - i\sqrt{1-i}\,\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right) + i\sqrt{1+i}\,\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]^2*Sqrt[1 + Cot[x]],x]
```

```
[Out] (-I)*Sqrt[1 - I]*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]] + I*Sqrt[1 + I]*ArcT
anh[Sqrt[1 + Cot[x]]/Sqrt[1 + I]] - (2*(1 + Cot[x])^(3/2))/3
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2*(1+cot(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{\cot(x)+1}\,\cot(x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2*(1+cot(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(cot(x) + 1)*cot(x)^2, x)
```

maple [B] time = 0.27, size = 356, normalized size = 1.60

$$-\frac{2\left(1+\cot(x)\right)^{\frac{3}{2}}}{3}+\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{4}+\frac{\sqrt{2}\,\left(2\sqrt{2}+2\right)\arctan\left(\frac{2\sqrt{1\cdots}}{}\right.}{2\sqrt{-2+2\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2*(1+cot(x))^(1/2),x)
```

```
[Out] -2/3*(1+cot(x))^(3/2)+1/4*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)-(
1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))+1/2*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1/2
))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/
2))-1/4*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2^(1/2)
+2)^(1/2))-1/2*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2
)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))-1/4*(2*2^(1/2)+2)^(1/2)*2^(1/2
)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))+1/2*2^(1/2)*(2*
2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1
/2))/(-2+2*2^(1/2))^(1/2))+1/4*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)+(1+c
ot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))-1/2*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*ar
ctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{\cot(x)+1}\,\cot(x)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2*(1+cot(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(cot(x) + 1)*cot(x)^2, x)
```

mupad [B] time = 0.63, size = 119, normalized size = 0.53

$$\operatorname{atanh}\left(4\sqrt{\cot(x)+1}\left(\sqrt{-\frac{\sqrt{2}}{8}-\frac{1}{8}}+\sqrt{\frac{\sqrt{2}}{8}-\frac{1}{8}}\right)^3\right)\left(2\sqrt{-\frac{\sqrt{2}}{8}-\frac{1}{8}}+2\sqrt{\frac{\sqrt{2}}{8}-\frac{1}{8}}\right)-\frac{2\,(\cot(x)+1)^{3/2}}{3}+\operatorname{atanh}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2*(cot(x) + 1)^(1/2),x)
```

```
[Out] atanh(4*(cot(x) + 1)^(1/2)*((- 2^(1/2)/8 - 1/8)^(1/2) + (2^(1/2)/8 - 1/8)^(
1/2))^3)*(2*(- 2^(1/2)/8 - 1/8)^(1/2) + 2*(2^(1/2)/8 - 1/8)^(1/2)) - (2*(co
t(x) + 1)^(3/2))/3 + atanh(4*(cot(x) + 1)^(1/2)*((- 2^(1/2)/8 - 1/8)^(1/2)
- (2^(1/2)/8 - 1/8)^(1/2))^3)*(2*(- 2^(1/2)/8 - 1/8)^(1/2) - 2*(2^(1/2)/8 -
 1/8)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{\cot(x)+1}\,\cot^2(x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)**2*(1+cot(x))**(1/2),x)
```

```
[Out] Integral(sqrt(cot(x) + 1)*cot(x)**2, x)
```

3.42 $\int \cot(x)\sqrt{1+\cot(x)}\,dx$

Optimal. Leaf size=135

$$-2\sqrt{\cot(x)+1}+\sqrt{\frac{1}{2}\left(\sqrt{2}-1\right)}\tan^{-1}\left(\frac{\left(2-\sqrt{2}\right)\cot(x)-3\sqrt{2}+4}{2\sqrt{5\sqrt{2}-7}\sqrt{\cot(x)+1}}\right)+\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\tanh^{-1}\left(\frac{\left(2+\sqrt{2}\right)\cot(x)+3}{2\sqrt{7+5\sqrt{2}}\sqrt{\cot(}}\right.$$

```
[Out] -2*(1+cot(x))^(1/2)+1/2*arctan(1/2*(4+cot(x)*(2-2^(1/2))-3*2^(1/2))/(1+cot(
x))^(1/2)/(-7+5*2^(1/2))^(1/2))*(-2+2*2^(1/2))^(1/2)+1/2*arctanh(1/2*(4+3*2
^(1/2)+cot(x)*(2+2^(1/2)))/(1+cot(x))^(1/2)/(7+5*2^(1/2))^(1/2))*(2+2*2^(1/
2))^(1/2)
```

Rubi [A] time = 0.24, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {3528, 3536, 3535, 203, 207}

$$-2\sqrt{\cot(x)+1}+\sqrt{\frac{1}{2}\left(\sqrt{2}-1\right)}\tan^{-1}\left(\frac{\left(2-\sqrt{2}\right)\cot(x)-3\sqrt{2}+4}{2\sqrt{5\sqrt{2}-7}\sqrt{\cot(x)+1}}\right)+\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\tanh^{-1}\left(\frac{\left(2+\sqrt{2}\right)\cot(x)+3}{2\sqrt{7+5\sqrt{2}}\sqrt{\cot(}}\right.$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]*Sqrt[1 + Cot[x]],x]
```

```
[Out] Sqrt[(-1 + Sqrt[2])/2]*ArcTan[(4 - 3*Sqrt[2] + (2 - Sqrt[2])*Cot[x])/(2*Sqr
t[-7 + 5*Sqrt[2]]*Sqrt[1 + Cot[x]])] + Sqrt[(1 + Sqrt[2])/2]*ArcTanh[(4 + 3
*Sqrt[2] + (2 + Sqrt[2])*Cot[x])/(2*Sqrt[7 + 5*Sqrt[2]]*Sqrt[1 + Cot[x]])]
- 2*Sqrt[1 + Cot[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 207

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

Rule 3528

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[(d*(a + b*Tan[e + f*x])^m)/(f*m), x] + Int
```

```
[(a + b*Tan[e + f*x])^(m - 1)*Simp[a*c - b*d + (b*c + a*d)*Tan[e + f*x], x]
, x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && GtQ[m, 0]
```

Rule 3535

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*b*c*d - 4*a*d^2 +
 x^2), x], x, (b*c - 2*a*d - b*d*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]]], x
] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
 && NeQ[c^2 + d^2, 0] && EqQ[2*a*c*d - b*(c^2 - d^2), 0]
```

Rule 3536

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> With[{q = Rt[a^2 + b^2, 2]}, Dist[1/(2*q), Int[(a
*c + b*d + c*q + (b*c - a*d + d*q)*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]],
x], x] - Dist[1/(2*q), Int[(a*c + b*d - c*q + (b*c - a*d - d*q)*Tan[e + f*x
])/Sqrt[a + b*Tan[e + f*x]], x], x]] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && NeQ[2*a*c*d - b
*(c^2 - d^2), 0] && (PerfectSquareQ[a^2 + b^2] || RationalQ[a, b, c, d])
```

Rubi steps

$$
\begin{aligned}
\int \cot(x)\sqrt{1+\cot(x)}\,dx &= -2\sqrt{1+\cot(x)} - \int \frac{1-\cot(x)}{\sqrt{1+\cot(x)}}\,dx \\
&= -2\sqrt{1+\cot(x)} + \frac{\int \frac{-\sqrt{2}-\left(-2-\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{2\sqrt{2}} - \frac{\int \frac{\sqrt{2}-\left(-2+\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{2\sqrt{2}} \\
&= -2\sqrt{1+\cot(x)} + \left(-4+3\sqrt{2}\right)\text{Subst}\left(\int \frac{1}{-2\sqrt{2}\left(-2+\sqrt{2}\right)-4\left(-2+\sqrt{2}\right)^2+x^2}\,dx \right. \\
&= \sqrt{\frac{1}{2}\left(-1+\sqrt{2}\right)}\tan^{-1}\left(\frac{4-3\sqrt{2}+\left(2-\sqrt{2}\right)\cot(x)}{2\sqrt{-7+5\sqrt{2}}\sqrt{1+\cot(x)}}\right) + \sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\tanh^{-1}\left(\frac{4+3}{2\sqrt{}}\right.
\end{aligned}
$$

Mathematica [C] time = 0.09, size = 61, normalized size = 0.45

$$
-2\sqrt{\cot(x)+1} + \sqrt{1-i}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right) + \sqrt{1+i}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]*Sqrt[1 + Cot[x]],x]
```

```
[Out] Sqrt[1 - I]*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]] + Sqrt[1 + I]*ArcTanh[Sqr
t[1 + Cot[x]]/Sqrt[1 + I]] - 2*Sqrt[1 + Cot[x]]
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{\cot(x)+1}\,\cot(x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(cot(x) + 1)*cot(x), x)
```

maple [B] time = 0.13, size = 249, normalized size = 1.84

$$-2\sqrt{1+\cot(x)}-\frac{\sqrt{2\sqrt{2}+2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{4}+\frac{\arctan\left(\frac{2\sqrt{1+\cot(x)}-\sqrt{2\sqrt{2}+2}}{\sqrt{-2+2\sqrt{2}}}\right)\sqrt{2}}{\sqrt{-2+2\sqrt{2}}}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)*(1+cot(x))^(1/2),x)
```

```
[Out] -2*(1+cot(x))^(1/2)-1/4*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^
(1/2)*(2*2^(1/2)+2)^(1/2))+1/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2
)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/(-2+2*2^(1/2))^(1/2)
*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/4*
(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2
))-1/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(
-2+2*2^(1/2))^(1/2))+1/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2
^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{\cot(x)+1}\,\cot(x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(cot(x) + 1)*cot(x), x)
```

mupad [B] time = 0.48, size = 210, normalized size = 1.56

$$\operatorname{atanh}\left(\frac{\sqrt{\cot(x)+1}}{4\sqrt{\frac{1}{8}-\frac{\sqrt{2}}{8}}}+\frac{\sqrt{\cot(x)+1}}{4\sqrt{\frac{\sqrt{2}}{8}+\frac{1}{8}}}-\frac{\sqrt{2}\,\sqrt{\cot(x)+1}}{8\sqrt{\frac{1}{8}-\frac{\sqrt{2}}{8}}}+\frac{\sqrt{2}\,\sqrt{\cot(x)+1}}{8\sqrt{\frac{\sqrt{2}}{8}+\frac{1}{8}}}\right)\left(2\sqrt{\frac{1}{8}-\frac{\sqrt{2}}{8}}+2\sqrt{\frac{\sqrt{2}}{8}+\frac{1}{8}}\right)-\text{at}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)*(cot(x) + 1)^(1/2),x)
```

```
[Out] atanh((cot(x) + 1)^(1/2)/(4*(1/8 - 2^(1/2)/8)^(1/2)) + (cot(x) + 1)^(1/2)/(
4*(2^(1/2)/8 + 1/8)^(1/2)) - (2^(1/2)*(cot(x) + 1)^(1/2))/(8*(1/8 - 2^(1/2)
/8)^(1/2)) + (2^(1/2)*(cot(x) + 1)^(1/2))/(8*(2^(1/2)/8 + 1/8)^(1/2)))*(2*(
1/8 - 2^(1/2)/8)^(1/2) + 2*(2^(1/2)/8 + 1/8)^(1/2)) - atanh((cot(x) + 1)^(1
/2)/(4*(2^(1/2)/8 + 1/8)^(1/2)) - (cot(x) + 1)^(1/2)/(4*(1/8 - 2^(1/2)/8)^(
1/2)) + (2^(1/2)*(cot(x) + 1)^(1/2))/(8*(1/8 - 2^(1/2)/8)^(1/2)) + (2^(1/2)
*(cot(x) + 1)^(1/2))/(8*(2^(1/2)/8 + 1/8)^(1/2)))*(2*(1/8 - 2^(1/2)/8)^(1/2
) - 2*(2^(1/2)/8 + 1/8)^(1/2)) - 2*(cot(x) + 1)^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{\cot{\left(x \right)}+1}\,\cot{\left(x \right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))**(1/2),x)
```

```
[Out] Integral(sqrt(cot(x) + 1)*cot(x), x)
```

3.43 $\int \cot^2(x)(1+\cot(x))^{3/2}\,dx$

Optimal. Leaf size=139

$$-\frac{2}{5}(\cot(x)+1)^{5/2}+2\sqrt{\cot(x)+1}-\sqrt{\sqrt{2}-1}\,\tan^{-1}\left(\frac{\left(1-\sqrt{2}\right)\cot(x)-2\sqrt{2}+3}{\sqrt{2\left(5\sqrt{2}-7\right)}\sqrt{\cot(x)+1}}\right)-\sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{\left(1+\sqrt{2}\right)\cot\ldots}{\sqrt{2\left(7+5\sqrt{2}\ldots}}\right.$$

```
[Out] -2/5*(1+cot(x))^(5/2)+2*(1+cot(x))^(1/2)-arctan((3+cot(x)*(1-2^(1/2))-2*2^(
1/2))/(1+cot(x))^(1/2)/(-14+10*2^(1/2))^(1/2))*(2^(1/2)-1)^(1/2)-arctanh((3
+2*2^(1/2)+cot(x)*(1+2^(1/2)))/(1+cot(x))^(1/2)/(14+10*2^(1/2))^(1/2))*(1+2
^(1/2))^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538, Rules used = {3543, 3482, 12, 3536, 3535, 203, 207}

$$-\frac{2}{5}(\cot(x)+1)^{5/2}+2\sqrt{\cot(x)+1}-\sqrt{\sqrt{2}-1}\,\tan^{-1}\left(\frac{\left(1-\sqrt{2}\right)\cot(x)-2\sqrt{2}+3}{\sqrt{2\left(5\sqrt{2}-7\right)}\sqrt{\cot(x)+1}}\right)-\sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{\left(1+\sqrt{2}\right)\cot\ldots}{\sqrt{2\left(7+5\sqrt{2}\ldots}}\right.$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]^2*(1 + Cot[x])^(3/2),x]
```

```
[Out] -(Sqrt[-1 + Sqrt[2]]*ArcTan[(3 - 2*Sqrt[2] + (1 - Sqrt[2])*Cot[x])/(Sqrt[2*
(-7 + 5*Sqrt[2])]*Sqrt[1 + Cot[x]])]) - Sqrt[1 + Sqrt[2]]*ArcTanh[(3 + 2*Sq
rt[2] + (1 + Sqrt[2])*Cot[x])/(Sqrt[2*(7 + 5*Sqrt[2])]*Sqrt[1 + Cot[x]])] +
 2*Sqrt[1 + Cot[x]] - (2*(1 + Cot[x])^(5/2))/5
```

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 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 207

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

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

Rule 3482

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(a +
b*Tan[c + d*x])^(n - 1))/(d*(n - 1)), x] + Int[(a^2 - b^2 + 2*a*b*Tan[c + d
*x])*(a + b*Tan[c + d*x])^(n - 2), x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2
+ b^2, 0] && GtQ[n, 1]
```

Rule 3535

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*b*c*d - 4*a*d^2 +
 x^2), x], x, (b*c - 2*a*d - b*d*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]]], x
] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
 && NeQ[c^2 + d^2, 0] && EqQ[2*a*c*d - b*(c^2 - d^2), 0]
```

Rule 3536

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> With[{q = Rt[a^2 + b^2, 2]}, Dist[1/(2*q), Int[(a
*c + b*d + c*q + (b*c - a*d + d*q)*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]],
x], x] - Dist[1/(2*q), Int[(a*c + b*d - c*q + (b*c - a*d - d*q)*Tan[e + f*x
])/Sqrt[a + b*Tan[e + f*x]], x], x]] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && NeQ[2*a*c*d - b
*(c^2 - d^2), 0] && (PerfectSquareQ[a^2 + b^2] || RationalQ[a, b, c, d])
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int \cot^2(x)(1+\cot(x))^{3/2}\,dx = -\frac{2}{5}(1+\cot(x))^{5/2} - \int (1+\cot(x))^{3/2}\,dx$$
$$= 2\sqrt{1+\cot(x)} - \frac{2}{5}(1+\cot(x))^{5/2} - \int \frac{2\cot(x)}{\sqrt{1+\cot(x)}}\,dx$$
$$= 2\sqrt{1+\cot(x)} - \frac{2}{5}(1+\cot(x))^{5/2} - 2\int \frac{\cot(x)}{\sqrt{1+\cot(x)}}\,dx$$
$$= 2\sqrt{1+\cot(x)} - \frac{2}{5}(1+\cot(x))^{5/2} - \frac{\int \frac{-1-\left(-1-\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{\sqrt{2}} + \frac{\int \frac{-1-\left(-1+\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{\sqrt{2}}$$
$$= 2\sqrt{1+\cot(x)} - \frac{2}{5}(1+\cot(x))^{5/2} - \left(-4+3\sqrt{2}\right)\mathrm{Subst}\left(\int \frac{1}{2\left(-1+\sqrt{2}\right)-4\left(-1+\sqrt{\right.}\right.}\right.$$
$$= -\sqrt{-1+\sqrt{2}}\,\tan^{-1}\left(\frac{3-2\sqrt{2}+\left(1-\sqrt{2}\right)\cot(x)}{\sqrt{2\left(-7+5\sqrt{2}\right)}\sqrt{1+\cot(x)}}\right) - \sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{3+2\sqrt{2}}{\sqrt{2\left(7+5\right.}}\right.$$

Mathematica [C] time = 0.32, size = 96, normalized size = 0.69

$$\frac{\sin(x)\left(-\frac{2}{5}\sin(x)(\cot(x)+1)^{5/2}\left(2\cot(x)+\csc^2(x)-5\right)-2\sin(x)(\cot(x)+1)^2\left(\frac{\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right)}{\sqrt{1-i}}+\frac{\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)}{\sqrt{1+i}}\right)\right.}{(\sin(x)+\cos(x))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]^2*(1 + Cot[x])^(3/2),x]
```

```
[Out] (Sin[x]*(-2*(ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]]/Sqrt[1 - I] + ArcTanh[Sq
rt[1 + Cot[x]]/Sqrt[1 + I]]/Sqrt[1 + I])*(1 + Cot[x])^2*Sin[x] - (2*(1 + Co
t[x])^(5/2)*(-5 + 2*Cot[x] + Csc[x]^2)*Sin[x])/5))/(Cos[x] + Sin[x])^2
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2*(1+cot(x))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (\cot(x)+1)^{\frac{3}{2}} \cot(x)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2*(1+cot(x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((cot(x) + 1)^(3/2)*cot(x)^2, x)
```

maple [B] time = 0.18, size = 265, normalized size = 1.91

$$-\frac{2(1+\cot(x))^{\frac{5}{2}}}{5}+2\sqrt{1+\cot(x)}+\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{4}-\frac{\arctan\left(\frac{2\sqrt{}}{}\right.}{\sqrt{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2*(1+cot(x))^(3/2),x)
```

```
[Out] -2/5*(1+cot(x))^(5/2)+2*(1+cot(x))^(1/2)+1/4*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln
(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))-1/(-2+2*2^(1/2))^(1
/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2
^(1/2)+2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2
))/(-2+2*2^(1/2))^(1/2))-1/4*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2
)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))-1/(-2+2*2^(1/2))^(1/2)*arctan((2*(1
+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)+2/(-2+2*2
^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2)
)^(1/2))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2*(1+cot(x))^(3/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [B] time = 1.00, size = 254, normalized size = 1.83

$$\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{\frac{1}{4}-\frac{\sqrt{2}}{4}}\,\sqrt{\cot(x)+1}\,64\mathrm{i}}{256\sqrt{\frac{1}{4}-\frac{\sqrt{2}}{4}}\,\sqrt{\frac{\sqrt{2}}{4}+\frac{1}{4}}-64}-\frac{\sqrt{2}\,\sqrt{\frac{\sqrt{2}}{4}+\frac{1}{4}}\,\sqrt{\cot(x)+1}\,64\mathrm{i}}{256\sqrt{\frac{1}{4}-\frac{\sqrt{2}}{4}}\,\sqrt{\frac{\sqrt{2}}{4}+\frac{1}{4}}-64}\right)\left(\sqrt{\frac{1}{4}-\frac{\sqrt{2}}{4}}\,2\mathrm{i}+\sqrt{\frac{\sqrt{2}}{4}+\frac{1}{4}}\,2\mathrm{i}\right)-\mathrm{atan}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2*(cot(x) + 1)^(3/2),x)
```

```
[Out] atan((2^(1/2)*(1/4 - 2^(1/2)/4)^(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(1/4 - 2
^(1/2)/4)^(1/2)*(2^(1/2)/4 + 1/4)^(1/2) - 64) - (2^(1/2)*(2^(1/2)/4 + 1/4)^
(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(1/4 - 2^(1/2)/4)^(1/2)*(2^(1/2)/4 + 1/4
)^(1/2) - 64))*((1/4 - 2^(1/2)/4)^(1/2)*2i + (2^(1/2)/4 + 1/4)^(1/2)*2i) -
atan((2^(1/2)*(1/4 - 2^(1/2)/4)^(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(1/4 - 2
^(1/2)/4)^(1/2)*(2^(1/2)/4 + 1/4)^(1/2) + 64) + (2^(1/2)*(2^(1/2)/4 + 1/4)^
(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(1/4 - 2^(1/2)/4)^(1/2)*(2^(1/2)/4 + 1/4
)^(1/2) + 64))*((1/4 - 2^(1/2)/4)^(1/2)*2i - (2^(1/2)/4 + 1/4)^(1/2)*2i) +
2*(cot(x) + 1)^(1/2) - (2*(cot(x) + 1)^(5/2))/5
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (\cot(x) + 1)^{\frac{3}{2}} \cot^2(x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)**2*(1+cot(x))**(3/2),x)
```

```
[Out] Integral((cot(x) + 1)**(3/2)*cot(x)**2, x)
```

3.44 $\int \cot(x)(1+\cot(x))^{3/2}\,dx$

Optimal. Leaf size=221

$$-\frac{2}{3}(\cot(x)+1)^{3/2}-2\sqrt{\cot(x)+1}-\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{2\sqrt{1+\sqrt{2}}}+\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right.}\right.}{2\sqrt{1}}$$

```
[Out] -2/3*(1+cot(x))^(3/2)-2*(1+cot(x))^(1/2)-1/2*ln(1+cot(x)+2^(1/2)-(1+cot(x))
^(1/2)*(2+2*2^(1/2))^(1/2))/(1+2^(1/2))^(1/2)+1/2*ln(1+cot(x)+2^(1/2)+(1+co
t(x))^(1/2)*(2+2*2^(1/2))^(1/2))/(1+2^(1/2))^(1/2)-arctan((-2*(1+cot(x))^(1
/2)+(2+2*2^(1/2))^(1/2))/(-2+2*2^(1/2))^(1/2))*(1+2^(1/2))^(1/2)+arctan((2*
(1+cot(x))^(1/2)+(2+2*2^(1/2))^(1/2))/(-2+2*2^(1/2))^(1/2))*(1+2^(1/2))^(1/
2)
```

Rubi [A] time = 0.21, antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.818, Rules used = {3528, 12, 3485, 708, 1094, 634, 618, 204, 628}

$$-\frac{2}{3}(\cot(x)+1)^{3/2}-2\sqrt{\cot(x)+1}-\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{2\sqrt{1+\sqrt{2}}}+\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right.}\right.}{2\sqrt{1}}$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]*(1 + Cot[x])^(3/2),x]
```

```
[Out] -(Sqrt[1 + Sqrt[2]]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] - 2*Sqrt[1 + Cot[x]])/Sqr
t[2*(-1 + Sqrt[2])]]) + Sqrt[1 + Sqrt[2]]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] + 2
*Sqrt[1 + Cot[x]])/Sqrt[2*(-1 + Sqrt[2])]] - 2*Sqrt[1 + Cot[x]] - (2*(1 + C
ot[x])^(3/2))/3 - Log[1 + Sqrt[2] + Cot[x] - Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 +
 Cot[x]]]/(2*Sqrt[1 + Sqrt[2]]) + Log[1 + Sqrt[2] + Cot[x] + Sqrt[2*(1 + Sq
rt[2])]*Sqrt[1 + Cot[x]]]/(2*Sqrt[1 + Sqrt[2]])
```

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 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 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 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 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 708

```
Int[1/(Sqrt[(d_) + (e_.)*(x_)]*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[2*
e, Subst[Int[1/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]],
x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1094

```
Int[((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(-1), x_Symbol] :> With[{q = Rt[a/
c, 2]}, With[{r = Rt[2*q - b/c, 2]}, Dist[1/(2*c*q*r), Int[(r - x)/(q - r*x
 + x^2), x], x] + Dist[1/(2*c*q*r), Int[(r + x)/(q + r*x + x^2), x], x]]] /
; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[b^2 - 4*a*c]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3528

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[(d*(a + b*Tan[e + f*x])^m)/(f*m), x] + Int
[(a + b*Tan[e + f*x])^(m - 1)*Simp[a*c - b*d + (b*c + a*d)*Tan[e + f*x], x]
, x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
```

```
0] && GtQ[m, 0]
```

Rubi steps

$$\begin{aligned}
\int \cot(x)(1+\cot(x))^{3/2}\,dx &= -\frac{2}{3}(1+\cot(x))^{3/2}-\int (1-\cot(x))\sqrt{1+\cot(x)}\,dx\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}-\int \frac{2}{\sqrt{1+\cot(x)}}\,dx\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}-2\int \frac{1}{\sqrt{1+\cot(x)}}\,dx\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}+2\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{1+x}\left(1+x^2\right)}\,dx,x,\cot(x)\right)\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}+4\,\mathrm{Subst}\left(\int \frac{1}{2-2x^2+x^4}\,dx,x,\sqrt{1+\cot(x)}\right)\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}+\frac{\mathrm{Subst}\left(\int \frac{\sqrt{2\left(1+\sqrt{2}\right)}-x}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}x+x^2}\,dx,x,\sqrt{1+\cot(x)}\right)}{\sqrt{1+\sqrt{2}}}\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}+\frac{\mathrm{Subst}\left(\int \frac{1}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}x+x^2}\,dx,x,\sqrt{1+\cot(x)}\right)}{\sqrt{2}}\\
&= -2\sqrt{1+\cot(x)}-\frac{2}{3}(1+\cot(x))^{3/2}-\frac{\log\left(1+\sqrt{2}+\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\mathrm{co}}\right.}{2\sqrt{1+\sqrt{2}}}\\
&= -\frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{\sqrt{-1+\sqrt{2}}}+\frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{\sqrt{-1+\sqrt{2}}}-2\sqrt{1+\cot(x)}-\frac{2}{3}
\end{aligned}$$

Mathematica [C] time = 0.26, size = 98, normalized size = 0.44

$$\frac{\sin(x)\left(-\frac{2}{3}(\cot(x)+1)^{3/2}(\cot(x)+4)(\sin(x)+\cos(x))+(1+i)\sin(x)(\cot(x)+1)^2\left(\sqrt{1+i}\,\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)-\right.\right.}{(\sin(x)+\cos(x))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]*(1 + Cot[x])^(3/2),x]
```

```
[Out] (Sin[x]*((1 + I)*((-I)*Sqrt[1 - I]*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]] +
Sqrt[1 + I]*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 + I]])*(1 + Cot[x])^2*Sin[x] -
(2*(1 + Cot[x])^(3/2)*(4 + Cot[x])*(Cos[x] + Sin[x]))/3))/(Cos[x] + Sin[x])
^2
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (\cot(x)+1)^{\frac{3}{2}} \cot(x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((cot(x) + 1)^(3/2)*cot(x), x)
```

maple [B] time = 0.12, size = 452, normalized size = 2.05

$$-\frac{2\,(1+\cot(x))^{\frac{3}{2}}}{3}-2\sqrt{1+\cot(x)}+\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{4}-\frac{\sqrt{2\sqrt{2}+2}\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)*(1+cot(x))^(3/2),x)
```

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

```
1/2)*(2*2^(1/2)+2)^(1/2))+1/2*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)+(1+co
t(x))^(1/2)*(2*2^(1/2)+2)^(1/2))+1/2*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(
1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))-
(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)
^(1/2))/(-2+2*2^(1/2))^(1/2))+2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(
1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (\cot(x)+1)^{\frac{3}{2}}\cot(x)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((cot(x) + 1)^(3/2)*cot(x), x)
```

mupad [B] time = 0.67, size = 254, normalized size = 1.15

$$-\mathrm{atan}\left(\frac{\sqrt{2}\,\sqrt{-\frac{\sqrt{2}}{4}-\frac{1}{4}}\,\sqrt{\cot(x)+1}\,64\mathrm{i}}{256\sqrt{\frac{\sqrt{2}}{4}-\frac{1}{4}}\,\sqrt{-\frac{\sqrt{2}}{4}-\frac{1}{4}}-64}-\frac{\sqrt{2}\,\sqrt{\frac{\sqrt{2}}{4}-\frac{1}{4}}\,\sqrt{\cot(x)+1}\,64\mathrm{i}}{256\sqrt{\frac{\sqrt{2}}{4}-\frac{1}{4}}\,\sqrt{-\frac{\sqrt{2}}{4}-\frac{1}{4}}-64}\right)\left(\sqrt{-\frac{\sqrt{2}}{4}-\frac{1}{4}}\,2\mathrm{i}+\sqrt{\frac{\sqrt{2}}{4}-\frac{1}{4}}\,2\mathrm{i}\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)*(cot(x) + 1)^(3/2),x)
```

```
[Out] atan((2^(1/2)*(- 2^(1/2)/4 - 1/4)^(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(2^(1/
2)/4 - 1/4)^(1/2)*(- 2^(1/2)/4 - 1/4)^(1/2) + 64) + (2^(1/2)*(2^(1/2)/4 - 1
/4)^(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(2^(1/2)/4 - 1/4)^(1/2)*(- 2^(1/2)/4
 - 1/4)^(1/2) + 64))*((- 2^(1/2)/4 - 1/4)^(1/2)*2i - (2^(1/2)/4 - 1/4)^(1/2
)*2i) - atan((2^(1/2)*(- 2^(1/2)/4 - 1/4)^(1/2)*(cot(x) + 1)^(1/2)*64i)/(25
6*(2^(1/2)/4 - 1/4)^(1/2)*(- 2^(1/2)/4 - 1/4)^(1/2) - 64) - (2^(1/2)*(2^(1/
2)/4 - 1/4)^(1/2)*(cot(x) + 1)^(1/2)*64i)/(256*(2^(1/2)/4 - 1/4)^(1/2)*(- 2
^(1/2)/4 - 1/4)^(1/2) - 64))*((- 2^(1/2)/4 - 1/4)^(1/2)*2i + (2^(1/2)/4 - 1
/4)^(1/2)*2i) - 2*(cot(x) + 1)^(1/2) - (2*(cot(x) + 1)^(3/2))/3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (\cot{(x)}+1)^{\frac{3}{2}}\cot{(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)*(1+cot(x))**(3/2),x)
```

```
[Out] Integral((cot(x) + 1)**(3/2)*cot(x), x)
```

3.45 $\int \frac{\cot^2(x)}{\sqrt{1+\cot(x)}}\,dx$

Optimal. Leaf size=214

$$-2\sqrt{\cot(x)+1}-\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{4\sqrt{1+\sqrt{2}}}+\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\right.}{4\sqrt{1+\sqrt{2}}}$$

```
[Out] -2*(1+cot(x))^(1/2)-1/4*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2+2*2^(1/2))^
(1/2))/(1+2^(1/2))^(1/2)+1/4*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2+2*2^(1
/2))^(1/2))/(1+2^(1/2))^(1/2)-1/2*arctan((-2*(1+cot(x))^(1/2)+(2+2*2^(1/2))
^(1/2))/(-2+2*2^(1/2))^(1/2))*(1+2^(1/2))^(1/2)+1/2*arctan((2*(1+cot(x))^(1
/2)+(2+2*2^(1/2))^(1/2))/(-2+2*2^(1/2))^(1/2))*(1+2^(1/2))^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 214, normalized size of antiderivative = 1.00, 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 = {3543, 3485, 708, 1094, 634, 618, 204, 628}

$$-2\sqrt{\cot(x)+1}-\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{4\sqrt{1+\sqrt{2}}}+\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\right.}{4\sqrt{1+\sqrt{2}}}$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]^2/Sqrt[1 + Cot[x]],x]
```

```
[Out] -(Sqrt[1 + Sqrt[2]]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] - 2*Sqrt[1 + Cot[x]])/Sqr
t[2*(-1 + Sqrt[2])]])/2 + (Sqrt[1 + Sqrt[2]]*ArcTan[(Sqrt[2*(1 + Sqrt[2])]
+ 2*Sqrt[1 + Cot[x]])/Sqrt[2*(-1 + Sqrt[2])]])/2 - 2*Sqrt[1 + Cot[x]] - Log
[1 + Sqrt[2] + Cot[x] - Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 + Cot[x]]]/(4*Sqrt[1 +
 Sqrt[2]]) + Log[1 + Sqrt[2] + Cot[x] + Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 + Cot[
x]]]/(4*Sqrt[1 + Sqrt[2]])
```

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 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 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 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 708

```
Int[1/(Sqrt[(d_) + (e_.)*(x_)]*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[2*
e, Subst[Int[1/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]],
x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1094

```
Int[((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(-1), x_Symbol] :> With[{q = Rt[a/
c, 2]}, With[{r = Rt[2*q - b/c, 2]}, Dist[1/(2*c*q*r), Int[(r - x)/(q - r*x
 + x^2), x], x] + Dist[1/(2*c*q*r), Int[(r + x)/(q + r*x + x^2), x], x]]] /
; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[b^2 - 4*a*c]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int \frac{\cot^2(x)}{\sqrt{1+\cot(x)}}\,dx = -2\sqrt{1+\cot(x)} - \int \frac{1}{\sqrt{1+\cot(x)}}\,dx$$

$$= -2\sqrt{1+\cot(x)} + \text{Subst}\left(\int \frac{1}{\sqrt{1+x}\,(1+x^2)}\,dx, x, \cot(x)\right)$$

$$= -2\sqrt{1+\cot(x)} + 2\,\text{Subst}\left(\int \frac{1}{2-2x^2+x^4}\,dx, x, \sqrt{1+\cot(x)}\right)$$

$$= -2\sqrt{1+\cot(x)} + \frac{\text{Subst}\left(\int \frac{\sqrt{2\left(1+\sqrt{2}\right)}-x}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}\,x+x^2}\,dx, x, \sqrt{1+\cot(x)}\right)}{2\sqrt{1+\sqrt{2}}} + \frac{\text{Subst}\left(\int \frac{\sqrt{2\left(1+\sqrt{2}\right)}+}{\sqrt{2}+\sqrt{2\left(1+\sqrt{2}\right)}}\right.}{2\sqrt{1}}$$

$$= -2\sqrt{1+\cot(x)} + \frac{\text{Subst}\left(\int \frac{1}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}\,x+x^2}\,dx, x, \sqrt{1+\cot(x)}\right)}{2\sqrt{2}} + \frac{\text{Subst}\left(\int \frac{1}{\sqrt{2}+\sqrt{2\left(1+\sqrt{2}\right)}}\right.}{2}$$

$$= -2\sqrt{1+\cot(x)} - \frac{\log\left(1+\sqrt{2}+\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\cot(x)}\right)}{4\sqrt{1+\sqrt{2}}} + \frac{\log\left(1+\sqrt{2}+\cot\right.}{}$$

$$= -\frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{2\sqrt{-1+\sqrt{2}}} + \frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{2\sqrt{-1+\sqrt{2}}} - 2\sqrt{1+\cot(x)} - \frac{\log\left(1+\right.}{}$$

Mathematica [C] time = 0.17, size = 67, normalized size = 0.31

$$-2\sqrt{\cot(x)+1} + \frac{1}{2}(1-i)^{3/2}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right) + \frac{1}{2}(1+i)^{3/2}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]^2/Sqrt[1 + Cot[x]],x]
```

```
[Out] ((1 - I)^(3/2)*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]])/2 + ((1 + I)^(3/2)*Ar
cTanh[Sqrt[1 + Cot[x]]/Sqrt[1 + I]])/2 - 2*Sqrt[1 + Cot[x]]
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)^2}{\sqrt{\cot(x)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cot(x)^2/sqrt(cot(x) + 1), x)
```

maple [B] time = 0.22, size = 442, normalized size = 2.07

$$-2\sqrt{1+\cot(x)} - \frac{\sqrt{2\sqrt{2}+2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{4} + \frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\right.}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2/(1+cot(x))^(1/2),x)
```

```
[Out] -2*(1+cot(x))^(1/2)-1/4*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^
(1/2)*(2*2^(1/2)+2)^(1/2))+1/8*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1
/2)-(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))+1/4*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2
^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2)
)^(1/2))-1/2*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-
(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/(-2+2*2^(1/2))^(1/2)*arctan((2
*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)+1/4*(2
*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))
-1/8*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^
(1/2)+2)^(1/2))+1/4*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1
+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))-1/2*(2*2^(1/2)+2)
/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2
*2^(1/2))^(1/2))+1/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/
2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)^2}{\sqrt{\cot(x)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cot(x)^2/sqrt(cot(x) + 1), x)
```

mupad [B] time = 0.44, size = 238, normalized size = 1.11

$$\operatorname{atanh}\left(\frac{16\sqrt{2}\,\sqrt{-\frac{\sqrt{2}}{16}-\frac{1}{16}}\,\sqrt{\cot(x)+1}}{128\sqrt{\frac{\sqrt{2}}{16}-\frac{1}{16}}\,\sqrt{-\frac{\sqrt{2}}{16}-\frac{1}{16}}-8}-\frac{16\sqrt{2}\,\sqrt{\frac{\sqrt{2}}{16}-\frac{1}{16}}\,\sqrt{\cot(x)+1}}{128\sqrt{\frac{\sqrt{2}}{16}-\frac{1}{16}}\,\sqrt{-\frac{\sqrt{2}}{16}-\frac{1}{16}}-8}\right)\left(2\sqrt{-\frac{\sqrt{2}}{16}-\frac{1}{16}}+2\sqrt{\frac{\sqrt{2}}{16}-\frac{1}{16}}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2/(cot(x) + 1)^(1/2),x)
```

```
[Out] atanh((16*2^(1/2)*(- 2^(1/2)/16 - 1/16)^(1/2)*(cot(x) + 1)^(1/2))/(128*(2^(
1/2)/16 - 1/16)^(1/2)*(- 2^(1/2)/16 - 1/16)^(1/2) - 8) - (16*2^(1/2)*(2^(1/
2)/16 - 1/16)^(1/2)*(cot(x) + 1)^(1/2))/(128*(2^(1/2)/16 - 1/16)^(1/2)*(- 2
^(1/2)/16 - 1/16)^(1/2) - 8))*(2*(- 2^(1/2)/16 - 1/16)^(1/2) + 2*(2^(1/2)/1
6 - 1/16)^(1/2)) - atanh((16*2^(1/2)*(- 2^(1/2)/16 - 1/16)^(1/2)*(cot(x) +
1)^(1/2))/(128*(2^(1/2)/16 - 1/16)^(1/2)*(- 2^(1/2)/16 - 1/16)^(1/2) + 8) +
 (16*2^(1/2)*(2^(1/2)/16 - 1/16)^(1/2)*(cot(x) + 1)^(1/2))/(128*(2^(1/2)/16
 - 1/16)^(1/2)*(- 2^(1/2)/16 - 1/16)^(1/2) + 8))*(2*(- 2^(1/2)/16 - 1/16)^(
1/2) - 2*(2^(1/2)/16 - 1/16)^(1/2)) - 2*(cot(x) + 1)^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot^2(x)}{\sqrt{\cot(x)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)**2/(1+cot(x))**(1/2),x)
```

```
[Out] Integral(cot(x)**2/sqrt(cot(x) + 1), x)
```

3.46 $\int \frac{\cot(x)}{\sqrt{1+\cot(x)}}\,dx$

Optimal. Leaf size=121

$$\frac{1}{2}\sqrt{\sqrt{2}-1}\tan^{-1}\left(\frac{\left(1-\sqrt{2}\right)\cot(x)-2\sqrt{2}+3}{\sqrt{2\left(5\sqrt{2}-7\right)}\sqrt{\cot(x)+1}}\right)+\frac{1}{2}\sqrt{1+\sqrt{2}}\tanh^{-1}\left(\frac{\left(1+\sqrt{2}\right)\cot(x)+2\sqrt{2}+3}{\sqrt{2\left(7+5\sqrt{2}\right)}\sqrt{\cot(x)+1}}\right)$$

```
[Out] 1/2*arctan((3+cot(x)*(1-2^(1/2))-2*2^(1/2))/(1+cot(x))^(1/2)/(-14+10*2^(1/2
))^(1/2))*(2^(1/2)-1)^(1/2)+1/2*arctanh((3+2*2^(1/2)+cot(x)*(1+2^(1/2)))/(1
+cot(x))^(1/2)/(14+10*2^(1/2))^(1/2))*(1+2^(1/2))^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {3536, 3535, 203, 207}

$$\frac{1}{2}\sqrt{\sqrt{2}-1}\tan^{-1}\left(\frac{\left(1-\sqrt{2}\right)\cot(x)-2\sqrt{2}+3}{\sqrt{2\left(5\sqrt{2}-7\right)}\sqrt{\cot(x)+1}}\right)+\frac{1}{2}\sqrt{1+\sqrt{2}}\tanh^{-1}\left(\frac{\left(1+\sqrt{2}\right)\cot(x)+2\sqrt{2}+3}{\sqrt{2\left(7+5\sqrt{2}\right)}\sqrt{\cot(x)+1}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]/Sqrt[1 + Cot[x]],x]
```

```
[Out] (Sqrt[-1 + Sqrt[2]]*ArcTan[(3 - 2*Sqrt[2] + (1 - Sqrt[2])*Cot[x])/(Sqrt[2*(
-7 + 5*Sqrt[2])]*Sqrt[1 + Cot[x]])])/2 + (Sqrt[1 + Sqrt[2]]*ArcTanh[(3 + 2*
Sqrt[2] + (1 + Sqrt[2])*Cot[x])/(Sqrt[2*(7 + 5*Sqrt[2])]*Sqrt[1 + Cot[x]])]
)/2
```

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 207

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

Rule 3535

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*b*c*d - 4*a*d^2 +
```

```
 x^2), x], x, (b*c - 2*a*d - b*d*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]]], x
] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
 && NeQ[c^2 + d^2, 0] && EqQ[2*a*c*d - b*(c^2 - d^2), 0]
```

Rule 3536

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> With[{q = Rt[a^2 + b^2, 2]}, Dist[1/(2*q), Int[(a
*c + b*d + c*q + (b*c - a*d + d*q)*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]],
x], x] - Dist[1/(2*q), Int[(a*c + b*d - c*q + (b*c - a*d - d*q)*Tan[e + f*x
])/Sqrt[a + b*Tan[e + f*x]], x], x]] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && NeQ[2*a*c*d - b
*(c^2 - d^2), 0] && (PerfectSquareQ[a^2 + b^2] || RationalQ[a, b, c, d])
```

Rubi steps

$$\int \frac{\cot(x)}{\sqrt{1+\cot(x)}}\,dx = \frac{\int \frac{-1-\left(-1-\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{2\sqrt{2}} - \frac{\int \frac{-1-\left(-1+\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{2\sqrt{2}}$$

$$= \frac{1}{2}\left(-4+3\sqrt{2}\right)\text{Subst}\left(\int \frac{1}{2\left(-1+\sqrt{2}\right)-4\left(-1+\sqrt{2}\right)^2+x^2}\,dx, x, \frac{1-2\left(-1+\sqrt{2}\right)-\left(-1+\right.}{\sqrt{1+\cot(x)}}\right.$$

$$= \frac{1}{2}\sqrt{-1+\sqrt{2}}\,\tan^{-1}\left(\frac{3-2\sqrt{2}+\left(1-\sqrt{2}\right)\cot(x)}{\sqrt{2\left(-7+5\sqrt{2}\right)}\sqrt{1+\cot(x)}}\right) + \frac{1}{2}\sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{3+2\sqrt{2}+\left(1+\right.}{\sqrt{2\left(7+5\sqrt{2}\right)}}\right.$$

Mathematica [C] time = 0.08, size = 51, normalized size = 0.42

$$\frac{\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right)}{\sqrt{1-i}} + \frac{\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)}{\sqrt{1+i}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]/Sqrt[1 + Cot[x]],x]
```

```
[Out] ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]]/Sqrt[1 - I] + ArcTanh[Sqrt[1 + Cot[x]
]/Sqrt[1 + I]]/Sqrt[1 + I]
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{\sqrt{\cot(x)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cot(x)/sqrt(cot(x) + 1), x)
```

maple [B] time = 0.16, size = 249, normalized size = 2.06

$$-\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{8}+\frac{\arctan\left(\frac{2\sqrt{1+\cot(x)}-\sqrt{2\sqrt{2}+2}}{\sqrt{-2+2\sqrt{2}}}\right)\sqrt{2}}{2\sqrt{-2+2\sqrt{2}}}-\frac{\arctan\left(\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)/(1+cot(x))^(1/2),x)
```

```
[Out] -1/8*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2^
(1/2)+2)^(1/2))+1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1
/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/(-2+2*2^(1/2))^(1/2)*arctan((
2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/8*(2*2^(1/2
)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2)
)+1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/
(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(
1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{\sqrt{\cot(x)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(cot(x)/sqrt(cot(x) + 1), x)
```

mupad [B] time = 0.41, size = 230, normalized size = 1.90

$$\operatorname{atanh}\left(\frac{16\sqrt{2}\sqrt{\frac{1}{16}-\frac{\sqrt{2}}{16}}\sqrt{\cot(x)+1}}{128\sqrt{\frac{1}{16}-\frac{\sqrt{2}}{16}}\sqrt{\frac{\sqrt{2}}{16}+\frac{1}{16}}-8}-\frac{16\sqrt{2}\sqrt{\frac{\sqrt{2}}{16}+\frac{1}{16}}\sqrt{\cot(x)+1}}{128\sqrt{\frac{1}{16}-\frac{\sqrt{2}}{16}}\sqrt{\frac{\sqrt{2}}{16}+\frac{1}{16}}-8}\right)\left(2\sqrt{\frac{1}{16}-\frac{\sqrt{2}}{16}}+2\sqrt{\frac{\sqrt{2}}{16}+\frac{1}{16}}\right)-\text{atan}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)/(cot(x) + 1)^(1/2),x)
```

```
[Out] atanh((16*2^(1/2)*(1/16 - 2^(1/2)/16)^(1/2)*(cot(x) + 1)^(1/2))/(128*(1/16
- 2^(1/2)/16)^(1/2)*(2^(1/2)/16 + 1/16)^(1/2) - 8) - (16*2^(1/2)*(2^(1/2)/1
6 + 1/16)^(1/2)*(cot(x) + 1)^(1/2))/(128*(1/16 - 2^(1/2)/16)^(1/2)*(2^(1/2)
/16 + 1/16)^(1/2) - 8))*(2*(1/16 - 2^(1/2)/16)^(1/2) + 2*(2^(1/2)/16 + 1/16
)^(1/2)) - atanh((16*2^(1/2)*(1/16 - 2^(1/2)/16)^(1/2)*(cot(x) + 1)^(1/2))/
(128*(1/16 - 2^(1/2)/16)^(1/2)*(2^(1/2)/16 + 1/16)^(1/2) + 8) + (16*2^(1/2)
*(2^(1/2)/16 + 1/16)^(1/2)*(cot(x) + 1)^(1/2))/(128*(1/16 - 2^(1/2)/16)^(1/
2)*(2^(1/2)/16 + 1/16)^(1/2) + 8))*(2*(1/16 - 2^(1/2)/16)^(1/2) - 2*(2^(1/2
)/16 + 1/16)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{\sqrt{\cot(x)+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))**(1/2),x)
```

```
[Out] Integral(cot(x)/sqrt(cot(x) + 1), x)
```

3.47 $\int \frac{\cot^2(x)}{(1+\cot(x))^{3/2}}\,dx$

Optimal. Leaf size=139

$$\frac{1}{\sqrt{\cot(x)+1}}+\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{2}-1\right)}\tan^{-1}\left(\frac{\left(2-\sqrt{2}\right)\cot(x)-3\sqrt{2}+4}{2\sqrt{5\sqrt{2}-7}\sqrt{\cot(x)+1}}\right)+\frac{1}{2}\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\tanh^{-1}\left(\frac{\left(2+\sqrt{2}\right)\cot(x)}{2\sqrt{7+5\sqrt{2}}\sqrt{\mathrm{c}}}\right.$$

```
[Out] 1/(1+cot(x))^(1/2)+1/4*arctan(1/2*(4+cot(x)*(2-2^(1/2))-3*2^(1/2))/(1+cot(x
))^(1/2)/(-7+5*2^(1/2))^(1/2))*(-2+2*2^(1/2))^(1/2)+1/4*arctanh(1/2*(4+3*2^
(1/2)+cot(x)*(2+2^(1/2)))/(1+cot(x))^(1/2)/(7+5*2^(1/2))^(1/2))*(2+2*2^(1/2
))^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {3542, 3536, 3535, 203, 207}

$$\frac{1}{\sqrt{\cot(x)+1}}+\frac{1}{2}\sqrt{\frac{1}{2}\left(\sqrt{2}-1\right)}\tan^{-1}\left(\frac{\left(2-\sqrt{2}\right)\cot(x)-3\sqrt{2}+4}{2\sqrt{5\sqrt{2}-7}\sqrt{\cot(x)+1}}\right)+\frac{1}{2}\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\tanh^{-1}\left(\frac{\left(2+\sqrt{2}\right)\cot(x)}{2\sqrt{7+5\sqrt{2}}\sqrt{\mathrm{c}}}\right.$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]^2/(1 + Cot[x])^(3/2),x]
```

```
[Out] (Sqrt[(-1 + Sqrt[2])/2]*ArcTan[(4 - 3*Sqrt[2] + (2 - Sqrt[2])*Cot[x])/(2*Sq
rt[-7 + 5*Sqrt[2]]*Sqrt[1 + Cot[x]])])/2 + (Sqrt[(1 + Sqrt[2])/2]*ArcTanh[(
4 + 3*Sqrt[2] + (2 + Sqrt[2])*Cot[x])/(2*Sqrt[7 + 5*Sqrt[2]]*Sqrt[1 + Cot[x
]])])/2 + 1/Sqrt[1 + Cot[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 207

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

Rule 3535

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*b*c*d - 4*a*d^2 +
 x^2), x], x, (b*c - 2*a*d - b*d*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]]], x
] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
 && NeQ[c^2 + d^2, 0] && EqQ[2*a*c*d - b*(c^2 - d^2), 0]
```

Rule 3536

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> With[{q = Rt[a^2 + b^2, 2]}, Dist[1/(2*q), Int[(a
*c + b*d + c*q + (b*c - a*d + d*q)*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]],
x], x] - Dist[1/(2*q), Int[(a*c + b*d - c*q + (b*c - a*d - d*q)*Tan[e + f*x
])/Sqrt[a + b*Tan[e + f*x]], x], x]] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && NeQ[2*a*c*d - b
*(c^2 - d^2), 0] && (PerfectSquareQ[a^2 + b^2] || RationalQ[a, b, c, d])
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{\cot^2(x)}{(1+\cot(x))^{3/2}}\,dx = \frac{1}{\sqrt{1+\cot(x)}} + \frac{1}{2}\int \frac{-1+\cot(x)}{\sqrt{1+\cot(x)}}\,dx$$

$$= \frac{1}{\sqrt{1+\cot(x)}} + \frac{\int \frac{-\sqrt{2}-\left(2-\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{4\sqrt{2}} - \frac{\int \frac{\sqrt{2}-\left(2+\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{4\sqrt{2}}$$

$$= \frac{1}{\sqrt{1+\cot(x)}} - \frac{1}{2}\left(-4+3\sqrt{2}\right)\text{Subst}\left(\int \frac{1}{2\sqrt{2}\left(2-\sqrt{2}\right)-4\left(2-\sqrt{2}\right)^2+x^2}\,dx, x, \frac{\sqrt{2}-2\cdots}{\cdots}\right.$$

$$= \frac{1}{2}\sqrt{\frac{1}{2}\left(-1+\sqrt{2}\right)}\tan^{-1}\left(\frac{4-3\sqrt{2}+\left(2-\sqrt{2}\right)\cot(x)}{2\sqrt{-7+5\sqrt{2}}\sqrt{1+\cot(x)}}\right) + \frac{1}{2}\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\tanh^{-1}\left(\frac{4+3\cdots}{2\sqrt{7\cdots}}\right.$$

Mathematica [C] time = 0.13, size = 65, normalized size = 0.47

$$\frac{1}{\sqrt{\cot(x)+1}}+\frac{1}{2}\sqrt{1-i}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right)+\frac{1}{2}\sqrt{1+i}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]^2/(1 + Cot[x])^(3/2),x]
```

```
[Out] (Sqrt[1 - I]*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]])/2 + (Sqrt[1 + I]*ArcTan
h[Sqrt[1 + Cot[x]]/Sqrt[1 + I]])/2 + 1/Sqrt[1 + Cot[x]]
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)^2}{(\cot(x)+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(cot(x)^2/(cot(x) + 1)^(3/2), x)
```

maple [B] time = 0.19, size = 249, normalized size = 1.79

$$-\frac{\sqrt{2\sqrt{2}+2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{8}+\frac{\arctan\left(\frac{2\sqrt{1+\cot(x)}-\sqrt{2\sqrt{2}+2}}{\sqrt{-2+2\sqrt{2}}}\right)\sqrt{2}}{2\sqrt{-2+2\sqrt{2}}}-\frac{\arctan\left(\frac{2\sqrt{1+}}{}\right.}{2\sqrt{-2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2/(1+cot(x))^(3/2),x)
```

```
[Out] -1/8*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2^(1/2)+2)
^(1/2))+1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(
```

```
1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+c
ot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/8*(2*2^(1/2)+2)^(
1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))-1/2/(-2+2*2^
(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))
^(1/2))+1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(
1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)+1/(1+cot(x))^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)^2}{(\cot(x)+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(cot(x)^2/(cot(x) + 1)^(3/2), x)
```

mupad [B] time = 0.50, size = 208, normalized size = 1.50

$$\frac{1}{\sqrt{\cot(x)+1}} - \operatorname{atanh}\left(\frac{\sqrt{\cot(x)+1}}{8\sqrt{\frac{\sqrt{2}}{32}+\frac{1}{32}}} - \frac{\sqrt{\cot(x)+1}}{8\sqrt{\frac{1}{32}-\frac{\sqrt{2}}{32}}} + \frac{\sqrt{2}\,\sqrt{\cot(x)+1}}{16\sqrt{\frac{1}{32}-\frac{\sqrt{2}}{32}}} + \frac{\sqrt{2}\,\sqrt{\cot(x)+1}}{16\sqrt{\frac{\sqrt{2}}{32}+\frac{1}{32}}}\right)\left(2\sqrt{\frac{1}{32}-\frac{\sqrt{2}}{32}} - 2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2/(cot(x) + 1)^(3/2),x)
```

```
[Out] 1/(cot(x) + 1)^(1/2) - atanh((cot(x) + 1)^(1/2)/(8*(2^(1/2)/32 + 1/32)^(1/2
)) - (cot(x) + 1)^(1/2)/(8*(1/32 - 2^(1/2)/32)^(1/2)) + (2^(1/2)*(cot(x) +
1)^(1/2))/(16*(1/32 - 2^(1/2)/32)^(1/2)) + (2^(1/2)*(cot(x) + 1)^(1/2))/(16
*(2^(1/2)/32 + 1/32)^(1/2)))*(2*(1/32 - 2^(1/2)/32)^(1/2) - 2*(2^(1/2)/32 +
 1/32)^(1/2)) + atanh((cot(x) + 1)^(1/2)/(8*(1/32 - 2^(1/2)/32)^(1/2)) + (c
ot(x) + 1)^(1/2)/(8*(2^(1/2)/32 + 1/32)^(1/2)) - (2^(1/2)*(cot(x) + 1)^(1/2
))/(16*(1/32 - 2^(1/2)/32)^(1/2)) + (2^(1/2)*(cot(x) + 1)^(1/2))/(16*(2^(1/
2)/32 + 1/32)^(1/2)))*(2*(1/32 - 2^(1/2)/32)^(1/2) + 2*(2^(1/2)/32 + 1/32)^
(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot^{2}(x)}{(\cot(x)+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)**2/(1+cot(x))**(3/2),x)

[Out] Integral(cot(x)**2/(cot(x) + 1)**(3/2), x)
```

3.48 $\int \frac{\cot(x)}{(1+\cot(x))^{3/2}}\,dx$

Optimal. Leaf size=226

$$-\frac{1}{\sqrt{\cot(x)+1}}-\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{4\sqrt{2\left(1+\sqrt{2}\right)}}+\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\cdots\right)}{4\sqrt{2\left(1+\sqrt{2}\right)}}$$

```
[Out] -1/(1+cot(x))^(1/2)+1/4*arctan((-2*(1+cot(x))^(1/2)+(2+2*2^(1/2))^(1/2))/(-
2+2*2^(1/2))^(1/2))*(2+2*2^(1/2))^(1/2)-1/4*arctan((2*(1+cot(x))^(1/2)+(2+2
*2^(1/2))^(1/2))/(-2+2*2^(1/2))^(1/2))*(2+2*2^(1/2))^(1/2)-1/4*ln(1+cot(x)+
2^(1/2)-(1+cot(x))^(1/2)*(2+2*2^(1/2))^(1/2))/(2+2*2^(1/2))^(1/2)+1/4*ln(1+
cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2+2*2^(1/2))^(1/2))/(2+2*2^(1/2))^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.909, Rules used = {3529, 21, 3485, 700, 1127, 1161, 618, 204, 1164, 628}

$$-\frac{1}{\sqrt{\cot(x)+1}}-\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{4\sqrt{2\left(1+\sqrt{2}\right)}}+\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\cdots\right)}{4\sqrt{2\left(1+\sqrt{2}\right)}}$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]/(1 + Cot[x])^(3/2),x]
```

```
[Out] (Sqrt[(1 + Sqrt[2])/2]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] - 2*Sqrt[1 + Cot[x]])/
Sqrt[2*(-1 + Sqrt[2])]])/2 - (Sqrt[(1 + Sqrt[2])/2]*ArcTan[(Sqrt[2*(1 + Sqr
t[2])] + 2*Sqrt[1 + Cot[x]])/Sqrt[2*(-1 + Sqrt[2])]])/2 - 1/Sqrt[1 + Cot[x]
] - Log[1 + Sqrt[2] + Cot[x] - Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 + Cot[x]]]/(4*S
qrt[2*(1 + Sqrt[2])]) + Log[1 + Sqrt[2] + Cot[x] + Sqrt[2*(1 + Sqrt[2])]*Sq
rt[1 + Cot[x]]]/(4*Sqrt[2*(1 + Sqrt[2])])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

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 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 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 700

```
Int[Sqrt[(d_) + (e_.)*(x_)]/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[2*e, S
ubst[Int[x^2/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x]
 /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1127

```
Int[(x_)^2/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a/c, 2]}, Dist[1/2, Int[(q + x^2)/(a + b*x^2 + c*x^4), x], x] - Dist[1/2, I
nt[(q - x^2)/(a + b*x^2 + c*x^4), x], x]] /; FreeQ[{a, b, c}, x] && LtQ[b^2
 - 4*a*c, 0] && PosQ[a*c]
```

Rule 1161

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[(2*d)/e - b/c, 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]] /; Fre
eQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[c*d^2 - a*e^2, 0] && (
GtQ[(2*d)/e - b/c, 0] || ( !LtQ[(2*d)/e - b/c, 0] && EqQ[d - e*Rt[a/c, 2],
0]))
```

Rule 1164

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :
> With[{q = Rt[(-2*d)/e - b/c, 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]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && EqQ[c
*d^2 - a*e^2, 0] &&  !GtQ[b^2 - 4*a*c, 0]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cot(x)}{(1+\cot(x))^{3/2}}\,dx &= -\frac{1}{\sqrt{1+\cot(x)}} - \frac{1}{2}\int \frac{-1-\cot(x)}{\sqrt{1+\cot(x)}}\,dx \\
&= -\frac{1}{\sqrt{1+\cot(x)}} + \frac{1}{2}\int \sqrt{1+\cot(x)}\,dx \\
&= -\frac{1}{\sqrt{1+\cot(x)}} - \frac{1}{2}\text{Subst}\left(\int \frac{\sqrt{1+x}}{1+x^2}\,dx, x, \cot(x)\right) \\
&= -\frac{1}{\sqrt{1+\cot(x)}} - \text{Subst}\left(\int \frac{x^2}{2-2x^2+x^4}\,dx, x, \sqrt{1+\cot(x)}\right) \\
&= -\frac{1}{\sqrt{1+\cot(x)}} + \frac{1}{2}\text{Subst}\left(\int \frac{\sqrt{2}-x^2}{2-2x^2+x^4}\,dx, x, \sqrt{1+\cot(x)}\right) - \frac{1}{2}\text{Subst}\left(\int \frac{\sqrt{2}+x^2}{2-2x^2+x\right. \\
&= -\frac{1}{\sqrt{1+\cot(x)}} - \frac{1}{4}\text{Subst}\left(\int \frac{1}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}\,x+x^2}\,dx, x, \sqrt{1+\cot(x)}\right) - \frac{1}{4}\text{Subst}\left(\right. \\
&= -\frac{1}{\sqrt{1+\cot(x)}} - \frac{\log\left(1+\sqrt{2}+\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\cot(x)}\right)}{4\sqrt{2\left(1+\sqrt{2}\right)}} + \frac{\log\left(1+\sqrt{2}+\text{co}\right.}{} \\
&= \frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{2\sqrt{2\left(-1+\sqrt{2}\right)}} - \frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{2\sqrt{2\left(-1+\sqrt{2}\right)}} - \frac{1}{\sqrt{1+\cot(x)}} - \frac{\log\left(1+\sqrt{}\right.}{}
\end{aligned}$$

Mathematica [C] time = 0.14, size = 71, normalized size = 0.31

$$-\frac{1}{\sqrt{\cot(x)+1}}+\frac{1}{2}i\sqrt{1-i}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right)-\frac{1}{2}i\sqrt{1+i}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]/(1 + Cot[x])^(3/2),x]
```

```
[Out] (I/2)*Sqrt[1 - I]*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]] - (I/2)*Sqrt[1 + I]
*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 + I]] - 1/Sqrt[1 + Cot[x]]
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{(\cot(x)+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(cot(x)/(cot(x) + 1)^(3/2), x)
```

maple [B] time = 0.13, size = 356, normalized size = 1.58

$$-\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{8}-\frac{\sqrt{2}\,\left(2\sqrt{2}+2\right)\arctan\left(\frac{2\sqrt{1+\cot(x)}-\sqrt{2\sqrt{2}+2}}{\sqrt{-2+2\sqrt{2}}}\right)}{4\sqrt{-2+2\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)/(1+cot(x))^(3/2),x)
```

```
[Out] -1/8*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2^
(1/2)+2)^(1/2))-1/4*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1
```

```
+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/8*(2*2^(1/2)+2)
^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))+1/4*(2*2^(
1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2)
)/(-2+2*2^(1/2))^(1/2))+1/8*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)
+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))-1/4*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1
/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(
1/2))-1/8*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/
2)+2)^(1/2))+1/4*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1
/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))-1/(1+cot(x))^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{(\cot(x)+1)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(cot(x)/(cot(x) + 1)^(3/2), x)
```

mupad [B] time = 0.40, size = 121, normalized size = 0.54

$$-\mathrm{atanh}\left(32\sqrt{\cot(x)+1}\left(\sqrt{-\frac{\sqrt{2}}{32}-\frac{1}{32}}+\sqrt{\frac{\sqrt{2}}{32}-\frac{1}{32}}\right)^3\right)\left(2\sqrt{-\frac{\sqrt{2}}{32}-\frac{1}{32}}+2\sqrt{\frac{\sqrt{2}}{32}-\frac{1}{32}}\right)-\frac{1}{\sqrt{\cot(x)+1}}-\mathrm{ata}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)/(cot(x) + 1)^(3/2),x)
```

```
[Out] - atanh(32*(cot(x) + 1)^(1/2)*((- 2^(1/2)/32 - 1/32)^(1/2) + (2^(1/2)/32 -
1/32)^(1/2))^3)*(2*(- 2^(1/2)/32 - 1/32)^(1/2) + 2*(2^(1/2)/32 - 1/32)^(1/2
)) - 1/(cot(x) + 1)^(1/2) - atanh(32*(cot(x) + 1)^(1/2)*((- 2^(1/2)/32 - 1/
32)^(1/2) - (2^(1/2)/32 - 1/32)^(1/2))^3)*(2*(- 2^(1/2)/32 - 1/32)^(1/2) -
2*(2^(1/2)/32 - 1/32)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot{\left(x \right)}}{\left(\cot{\left(x \right)}+1\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))**(3/2),x)
```

```
[Out] Integral(cot(x)/(cot(x) + 1)**(3/2), x)
```

3.49 $\int \frac{\cot^2(x)}{(1+\cot(x))^{5/2}}\,dx$

Optimal. Leaf size=143

$$-\frac{1}{\sqrt{\cot(x)+1}}+\frac{1}{3(\cot(x)+1)^{3/2}}+\frac{1}{4}\sqrt{\sqrt{2}-1}\,\tan^{-1}\left(\frac{\left(1-\sqrt{2}\right)\cot(x)-2\sqrt{2}+3}{\sqrt{2\left(5\sqrt{2}-7\right)}\sqrt{\cot(x)+1}}\right)+\frac{1}{4}\sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{\left(1+\sqrt{2}\right.}{\sqrt{2\left(7\right.}}\right.$$

```
[Out] 1/3/(1+cot(x))^(3/2)-1/(1+cot(x))^(1/2)+1/4*arctan((3+cot(x)*(1-2^(1/2))-2*
2^(1/2))/(1+cot(x))^(1/2)/(-14+10*2^(1/2))^(1/2))*(2^(1/2)-1)^(1/2)+1/4*arc
tanh((3+2*2^(1/2)+cot(x)*(1+2^(1/2)))/(1+cot(x))^(1/2)/(14+10*2^(1/2))^(1/2
))*(1+2^(1/2))^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.538, Rules used = {3542, 3529, 12, 3536, 3535, 203, 207}

$$-\frac{1}{\sqrt{\cot(x)+1}}+\frac{1}{3(\cot(x)+1)^{3/2}}+\frac{1}{4}\sqrt{\sqrt{2}-1}\,\tan^{-1}\left(\frac{\left(1-\sqrt{2}\right)\cot(x)-2\sqrt{2}+3}{\sqrt{2\left(5\sqrt{2}-7\right)}\sqrt{\cot(x)+1}}\right)+\frac{1}{4}\sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{\left(1+\sqrt{2}\right.}{\sqrt{2\left(7\right.}}\right.$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]^2/(1 + Cot[x])^(5/2),x]
```

```
[Out] (Sqrt[-1 + Sqrt[2]]*ArcTan[(3 - 2*Sqrt[2] + (1 - Sqrt[2])*Cot[x])/(Sqrt[2*(
-7 + 5*Sqrt[2])]*Sqrt[1 + Cot[x]])])/4 + (Sqrt[1 + Sqrt[2]]*ArcTanh[(3 + 2*
Sqrt[2] + (1 + Sqrt[2])*Cot[x])/(Sqrt[2*(7 + 5*Sqrt[2])]*Sqrt[1 + Cot[x]])]
)/4 + 1/(3*(1 + Cot[x])^(3/2)) - 1/Sqrt[1 + Cot[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 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 207

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

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

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3535

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> Dist[(-2*d^2)/f, Subst[Int[1/(2*b*c*d - 4*a*d^2 +
 x^2), x], x, (b*c - 2*a*d - b*d*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]]], x
] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
 && NeQ[c^2 + d^2, 0] && EqQ[2*a*c*d - b*(c^2 - d^2), 0]
```

Rule 3536

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(a_) + (b_.)*tan[(e_.) + (
f_.)*(x_)]], x_Symbol] :> With[{q = Rt[a^2 + b^2, 2]}, Dist[1/(2*q), Int[(a
*c + b*d + c*q + (b*c - a*d + d*q)*Tan[e + f*x])/Sqrt[a + b*Tan[e + f*x]],
x], x] - Dist[1/(2*q), Int[(a*c + b*d - c*q + (b*c - a*d - d*q)*Tan[e + f*x
])/Sqrt[a + b*Tan[e + f*x]], x], x]] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ
[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && NeQ[2*a*c*d - b
*(c^2 - d^2), 0] && (PerfectSquareQ[a^2 + b^2] || RationalQ[a, b, c, d])
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\cot^2(x)}{(1+\cot(x))^{5/2}}\,dx &= \frac{1}{3(1+\cot(x))^{3/2}}+\frac{1}{2}\int \frac{-1+\cot(x)}{(1+\cot(x))^{3/2}}\,dx\\ &= \frac{1}{3(1+\cot(x))^{3/2}}-\frac{1}{\sqrt{1+\cot(x)}}+\frac{1}{4}\int \frac{2\cot(x)}{\sqrt{1+\cot(x)}}\,dx\\ &= \frac{1}{3(1+\cot(x))^{3/2}}-\frac{1}{\sqrt{1+\cot(x)}}+\frac{1}{2}\int \frac{\cot(x)}{\sqrt{1+\cot(x)}}\,dx\\ &= \frac{1}{3(1+\cot(x))^{3/2}}-\frac{1}{\sqrt{1+\cot(x)}}+\frac{\int \frac{-1-\left(-1-\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{4\sqrt{2}}-\frac{\int \frac{-1-\left(-1+\sqrt{2}\right)\cot(x)}{\sqrt{1+\cot(x)}}\,dx}{4\sqrt{2}}\\ &= \frac{1}{3(1+\cot(x))^{3/2}}-\frac{1}{\sqrt{1+\cot(x)}}+\frac{1}{4}\left(-4+3\sqrt{2}\right)\mathrm{Subst}\left(\int \frac{1}{2\left(-1+\sqrt{2}\right)-4\left(-1+\sqrt{2}\right)\right.\\ &= \frac{1}{4}\sqrt{-1+\sqrt{2}}\,\tan^{-1}\left(\frac{3-2\sqrt{2}+\left(1-\sqrt{2}\right)\cot(x)}{\sqrt{2\left(-7+5\sqrt{2}\right)}\sqrt{1+\cot(x)}}\right)+\frac{1}{4}\sqrt{1+\sqrt{2}}\,\tanh^{-1}\left(\frac{3+2\sqrt{2}+(}{\sqrt{2\left(7+5\sqrt{2}\right.}}\right.\end{aligned}$$

Mathematica [C] time = 0.41, size = 75, normalized size = 0.52

$$\frac{-3\cot(x)-2}{3(\cot(x)+1)^{3/2}}+\frac{\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right)}{2\sqrt{1-i}}+\frac{\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)}{2\sqrt{1+i}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]^2/(1 + Cot[x])^(5/2),x]
```

```
[Out] ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]]/(2*Sqrt[1 - I]) + ArcTanh[Sqrt[1 + Co
t[x]]/Sqrt[1 + I]]/(2*Sqrt[1 + I]) + (-2 - 3*Cot[x])/(3*(1 + Cot[x])^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)^2}{(\cot(x)+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(cot(x)^2/(cot(x) + 1)^(5/2), x)
```

maple [B] time = 0.19, size = 265, normalized size = 1.85

$$-\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{16}+\frac{\arctan\left(\frac{2\sqrt{1+\cot(x)}-\sqrt{2\sqrt{2}+2}}{\sqrt{-2+2\sqrt{2}}}\right)\sqrt{2}}{4\sqrt{-2+2\sqrt{2}}}-\frac{\arctan\left(\frac{2\sqrt{\cdots}}{\cdots}\right)}{2\sqrt{\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2/(1+cot(x))^(5/2),x)
```

```
[Out] -1/16*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2
^(1/2)+2)^(1/2))+1/4/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(
1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/2/(-2+2*2^(1/2))^(1/2)*arcta
n((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/16*(2*2^
(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(
1/2))+1/4/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/
2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot
(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/3/(1+cot(x))^(3/2)-
1/(1+cot(x))^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\cot(x)^{2}}{(\cot(x)+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)^2/(1+cot(x))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(cot(x)^2/(cot(x) + 1)^(5/2), x)
```

mupad [B] time = 0.80, size = 242, normalized size = 1.69

$$\operatorname{atanh}\left(\frac{4\sqrt{2}\,\sqrt{\frac{1}{64}-\frac{\sqrt{2}}{64}}\,\sqrt{\cot(x)+1}}{64\sqrt{\frac{1}{64}-\frac{\sqrt{2}}{64}}\,\sqrt{\frac{\sqrt{2}}{64}+\frac{1}{64}}-1}-\frac{4\sqrt{2}\,\sqrt{\frac{\sqrt{2}}{64}+\frac{1}{64}}\,\sqrt{\cot(x)+1}}{64\sqrt{\frac{1}{64}-\frac{\sqrt{2}}{64}}\,\sqrt{\frac{\sqrt{2}}{64}+\frac{1}{64}}-1}\right)\left(2\sqrt{\frac{1}{64}-\frac{\sqrt{2}}{64}}+2\sqrt{\frac{\sqrt{2}}{64}+\frac{1}{64}}\right)-\operatorname{atanh}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)^2/(cot(x) + 1)^(5/2),x)
```

```
[Out] atanh((4*2^(1/2)*(1/64 - 2^(1/2)/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(1/64 -
2^(1/2)/64)^(1/2)*(2^(1/2)/64 + 1/64)^(1/2) - 1) - (4*2^(1/2)*(2^(1/2)/64 +
 1/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(1/64 - 2^(1/2)/64)^(1/2)*(2^(1/2)/64
+ 1/64)^(1/2) - 1))*(2*(1/64 - 2^(1/2)/64)^(1/2) + 2*(2^(1/2)/64 + 1/64)^(1
/2)) - atanh((4*2^(1/2)*(1/64 - 2^(1/2)/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(
1/64 - 2^(1/2)/64)^(1/2)*(2^(1/2)/64 + 1/64)^(1/2) + 1) + (4*2^(1/2)*(2^(1/
2)/64 + 1/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(1/64 - 2^(1/2)/64)^(1/2)*(2^(1
/2)/64 + 1/64)^(1/2) + 1))*(2*(1/64 - 2^(1/2)/64)^(1/2) - 2*(2^(1/2)/64 + 1
/64)^(1/2)) - (cot(x) + 2/3)/(cot(x) + 1)^(3/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot^2(x)}{(\cot(x)+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)**2/(1+cot(x))**(5/2),x)
```

```
[Out] Integral(cot(x)**2/(cot(x) + 1)**(5/2), x)
```

3.50 $\int \frac{\cot(x)}{(1+\cot(x))^{5/2}}\,dx$

Optimal. Leaf size=216

$$-\frac{1}{3(\cot(x)+1)^{3/2}}+\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{8\sqrt{1+\sqrt{2}}}-\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}\right.}{8\sqrt{1+\sqrt{2}}}$$

```
[Out] -1/3/(1+cot(x))^(3/2)+1/8*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2+2*2^(1/2)
)^(1/2))/(1+2^(1/2))^(1/2)-1/8*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2+2*2^
(1/2))^(1/2))/(1+2^(1/2))^(1/2)+1/4*arctan((-2*(1+cot(x))^(1/2)+(2+2*2^(1/2
))^(1/2))/(-2+2*2^(1/2))^(1/2))*(1+2^(1/2))^(1/2)-1/4*arctan((2*(1+cot(x))^
(1/2)+(2+2*2^(1/2))^(1/2))/(-2+2*2^(1/2))^(1/2))*(1+2^(1/2))^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 11, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.818, Rules used = {3529, 21, 3485, 708, 1094, 634, 618, 204, 628}

$$-\frac{1}{3(\cot(x)+1)^{3/2}}+\frac{\log\left(\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}+\sqrt{2}+1\right)}{8\sqrt{1+\sqrt{2}}}-\frac{\log\left(\cot(x)+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{\cot(x)+1}\right.}{8\sqrt{1+\sqrt{2}}}$$

Antiderivative was successfully verified.

```
[In] Int[Cot[x]/(1 + Cot[x])^(5/2),x]
```

```
[Out] (Sqrt[1 + Sqrt[2]]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] - 2*Sqrt[1 + Cot[x]])/Sqrt
[2*(-1 + Sqrt[2])]])/4 - (Sqrt[1 + Sqrt[2]]*ArcTan[(Sqrt[2*(1 + Sqrt[2])] +
 2*Sqrt[1 + Cot[x]])/Sqrt[2*(-1 + Sqrt[2])]])/4 - 1/(3*(1 + Cot[x])^(3/2))
+ Log[1 + Sqrt[2] + Cot[x] - Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 + Cot[x]]]/(8*Sqr
t[1 + Sqrt[2]]) - Log[1 + Sqrt[2] + Cot[x] + Sqrt[2*(1 + Sqrt[2])]*Sqrt[1 +
 Cot[x]]]/(8*Sqrt[1 + Sqrt[2]])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

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 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 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 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 708

```
Int[1/(Sqrt[(d_) + (e_.)*(x_)]*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[2*
e, Subst[Int[1/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]],
x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1094

```
Int[((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(-1), x_Symbol] :> With[{q = Rt[a/
c, 2]}, With[{r = Rt[2*q - b/c, 2]}, Dist[1/(2*c*q*r), Int[(r - x)/(q - r*x
 + x^2), x], x] + Dist[1/(2*c*q*r), Int[(r + x)/(q + r*x + x^2), x], x]]] /
; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[b^2 - 4*a*c]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
```

```
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rubi steps

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

$$= -\frac{1}{3(1+\cot(x))^{3/2}} + \frac{1}{2}\int \frac{1}{\sqrt{1+\cot(x)}}\,dx$$

$$= -\frac{1}{3(1+\cot(x))^{3/2}} - \frac{1}{2}\,\mathrm{Subst}\left(\int \frac{1}{\sqrt{1+x}\,(1+x^2)}\,dx, x, \cot(x)\right)$$

$$= -\frac{1}{3(1+\cot(x))^{3/2}} - \mathrm{Subst}\left(\int \frac{1}{2-2x^2+x^4}\,dx, x, \sqrt{1+\cot(x)}\right)$$

$$= -\frac{1}{3(1+\cot(x))^{3/2}} - \frac{\mathrm{Subst}\left(\int \frac{\sqrt{2\left(1+\sqrt{2}\right)}-x}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}\,x+x^2}\,dx, x, \sqrt{1+\cot(x)}\right)}{4\sqrt{1+\sqrt{2}}} - \frac{\mathrm{Subst}\left(\int \frac{\sqrt{2(1+\sqrt{}}}{\sqrt{2}+\sqrt{2(1+}}\right.}{4}$$

$$= -\frac{1}{3(1+\cot(x))^{3/2}} - \frac{\mathrm{Subst}\left(\int \frac{1}{\sqrt{2}-\sqrt{2\left(1+\sqrt{2}\right)}\,x+x^2}\,dx, x, \sqrt{1+\cot(x)}\right)}{4\sqrt{2}} - \frac{\mathrm{Subst}\left(\int \frac{1}{\sqrt{2}+\sqrt{2(1+}}\right.}{}$$

$$= -\frac{1}{3(1+\cot(x))^{3/2}} + \frac{\log\left(1+\sqrt{2}+\cot(x)-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\cot(x)}\right)}{8\sqrt{1+\sqrt{2}}} - \frac{\log\left(1+\sqrt{2}+\right.}{}$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{4\sqrt{-1+\sqrt{2}}} - \frac{\tan^{-1}\left(\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\cot(x)}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right)}{4\sqrt{-1+\sqrt{2}}} - \frac{1}{3(1+\cot(x))^{3/2}} + \frac{\log\left(1+\right.}{}$$

Mathematica [C] time = 0.24, size = 69, normalized size = 0.32

$$-\frac{1}{3(\cot(x)+1)^{3/2}} - \frac{1}{4}(1-i)^{3/2}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1-i}}\right) - \frac{1}{4}(1+i)^{3/2}\tanh^{-1}\left(\frac{\sqrt{\cot(x)+1}}{\sqrt{1+i}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Cot[x]/(1 + Cot[x])^(5/2),x]
```

```
[Out] -1/4*((1 - I)^(3/2)*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 - I]]) - ((1 + I)^(3/2)
*ArcTanh[Sqrt[1 + Cot[x]]/Sqrt[1 + I]])/4 - 1/(3*(1 + Cot[x])^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{(\cot(x)+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(cot(x)/(cot(x) + 1)^(5/2), x)
```

maple [B] time = 0.13, size = 444, normalized size = 2.06

$$-\frac{\sqrt{2\sqrt{2}+2}\,\sqrt{2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\cot(x)}\,\sqrt{2\sqrt{2}+2}\right)}{16}+\frac{\sqrt{2\sqrt{2}+2}\,\ln\left(1+\cot(x)+\sqrt{2}-\sqrt{1+\mathrm{co}}\right.}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)/(1+cot(x))^(5/2),x)
```

```
[Out] -1/16*(2*2^(1/2)+2)^(1/2)*2^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/2)*(2*2
^(1/2)+2)^(1/2))+1/8*(2*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)-(1+cot(x))^(1/
2)*(2*2^(1/2)+2)^(1/2))-1/8*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arct
an((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/4*(2*2^
(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)-(2*2^(1/2)+2)^(1/2
))/(-2+2*2^(1/2))^(1/2))-1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2
)-(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))*2^(1/2)+1/16*(2*2^(1/2)+2)^(1/
2)*2^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))-1/8*(2
*2^(1/2)+2)^(1/2)*ln(1+cot(x)+2^(1/2)+(1+cot(x))^(1/2)*(2*2^(1/2)+2)^(1/2))
-1/8*2^(1/2)*(2*2^(1/2)+2)/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+
(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2))+1/4*(2*2^(1/2)+2)/(-2+2*2^(1/2))
```

```
^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/(-2+2*2^(1/2))^(1/2)
)-1/2/(-2+2*2^(1/2))^(1/2)*arctan((2*(1+cot(x))^(1/2)+(2*2^(1/2)+2)^(1/2))/
(-2+2*2^(1/2))^(1/2))*2^(1/2)-1/3/(1+cot(x))^(3/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{(\cot(x)+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(cot(x)/(cot(x) + 1)^(5/2), x)
```

mupad [B] time = 0.71, size = 238, normalized size = 1.10

$$\operatorname{atanh}\left(\frac{4\sqrt{2}\sqrt{-\frac{\sqrt{2}}{64}-\frac{1}{64}}\sqrt{\cot(x)+1}}{64\sqrt{\frac{\sqrt{2}}{64}-\frac{1}{64}}\sqrt{-\frac{\sqrt{2}}{64}-\frac{1}{64}}+1}+\frac{4\sqrt{2}\sqrt{\frac{\sqrt{2}}{64}-\frac{1}{64}}\sqrt{\cot(x)+1}}{64\sqrt{\frac{\sqrt{2}}{64}-\frac{1}{64}}\sqrt{-\frac{\sqrt{2}}{64}-\frac{1}{64}}+1}\right)\left(2\sqrt{-\frac{\sqrt{2}}{64}-\frac{1}{64}}-2\sqrt{\frac{\sqrt{2}}{64}-\frac{1}{64}}\right)-\mathrm{at}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cot(x)/(cot(x) + 1)^(5/2),x)
```

```
[Out] atanh((4*2^(1/2)*(- 2^(1/2)/64 - 1/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(2^(1/
2)/64 - 1/64)^(1/2)*(- 2^(1/2)/64 - 1/64)^(1/2) + 1) + (4*2^(1/2)*(2^(1/2)/
64 - 1/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(2^(1/2)/64 - 1/64)^(1/2)*(- 2^(1/
2)/64 - 1/64)^(1/2) + 1))*(2*(- 2^(1/2)/64 - 1/64)^(1/2) - 2*(2^(1/2)/64 -
1/64)^(1/2)) - atanh((4*2^(1/2)*(- 2^(1/2)/64 - 1/64)^(1/2)*(cot(x) + 1)^(1
/2))/(64*(2^(1/2)/64 - 1/64)^(1/2)*(- 2^(1/2)/64 - 1/64)^(1/2) - 1) - (4*2^
(1/2)*(2^(1/2)/64 - 1/64)^(1/2)*(cot(x) + 1)^(1/2))/(64*(2^(1/2)/64 - 1/64)
^(1/2)*(- 2^(1/2)/64 - 1/64)^(1/2) - 1))*(2*(- 2^(1/2)/64 - 1/64)^(1/2) + 2
*(2^(1/2)/64 - 1/64)^(1/2)) - 1/(3*(cot(x) + 1)^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cot(x)}{(\cot(x)+1)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cot(x)/(1+cot(x))**(5/2),x)
```

```
[Out] Integral(cot(x)/(cot(x) + 1)**(5/2), x)
```

3.51 $\int (e\cot(c+dx))^{3/2}(a+b\cot(c+dx))\,dx$

Optimal. Leaf size=247

$$-\frac{e^{3/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{e^{3/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+d}\right.}{2\sqrt{2}\,d}$$

```
[Out] -2/3*b*(e*cot(d*x+c))^(3/2)/d-1/2*(a+b)*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x
+c))^(1/2)/e^(1/2))/d*2^(1/2)+1/2*(a+b)*e^(3/2)*arctan(1+2^(1/2)*(e*cot(d*x
+c))^(1/2)/e^(1/2))/d*2^(1/2)-1/4*(a-b)*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/
2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)+1/4*(a-b)*e^(3/2)*ln(e^(1/2)+cot
(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)-2*a*e*(e*cot(d*x+c)
)^(1/2)/d
```

Rubi [A] time = 0.21, antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3528, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{e^{3/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{e^{3/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+d}\right.}{2\sqrt{2}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x]),x]
```

```
[Out] -(((a + b)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqr
t[2]*d)) + ((a + b)*e^(3/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[
e]])/(Sqrt[2]*d) - (2*a*e*Sqrt[e*Cot[c + d*x]])/d - (2*b*(e*Cot[c + d*x])^(
3/2))/(3*d) - ((a - b)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]
*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d) + ((a - b)*e^(3/2)*Log[Sqrt[e] + Sqrt
[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d)
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3528

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

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rubi steps

$$
\begin{aligned}
\int (e\cot(c+dx))^{3/2}(a+b\cot(c+dx))\,dx &= -\frac{2b(e\cot(c+dx))^{3/2}}{3d} + \int \sqrt{e\cot(c+dx)}\,(-be+ae\cot(c+dx))\,dx \\
&= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2b(e\cot(c+dx))^{3/2}}{3d} + \int \frac{-ae^2-be^2\cot(c+a}{\sqrt{e\cot(c+dx)}} \\
&= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2b(e\cot(c+dx))^{3/2}}{3d} + \frac{2\,\mathrm{Subst}\left(\int \frac{ae^3+be^2x^2}{e^2+x^4}\,dx\right.}{d} \\
&= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2b(e\cot(c+dx))^{3/2}}{3d} + \frac{\left((a-b)e^2\right)\mathrm{Subst}\left(\int \frac{e}{e^2}\right.}{} \\
&= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2b(e\cot(c+dx))^{3/2}}{3d} - \frac{\left((a-b)e^{3/2}\right)\mathrm{Subst}\left(\int\right.}{} \\
&= -\frac{2ae\sqrt{e\cot(c+dx)}}{d} - \frac{2b(e\cot(c+dx))^{3/2}}{3d} - \frac{(a-b)e^{3/2}\log\left(\sqrt{e}+\right.}{} \\
&= -\frac{(a+b)e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d} + \frac{(a+b)e^{3/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}}{}\right.}{\sqrt{2}\,d}
\end{aligned}
$$

Mathematica [C] time = 0.13, size = 68, normalized size = 0.28

$$
-\frac{2e\sqrt{e\cot(c+dx)}\left(3a\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\tan^2(c+dx)\right)+b\cot(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\tan^2(c+dx)\right)\right)}{3d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x]),x]
```

```
[Out] (-2*e*Sqrt[e*Cot[c + d*x]]*(b*Cot[c + d*x]*Hypergeometric2F1[-3/4, 1, 1/4,
-Tan[c + d*x]^2] + 3*a*Hypergeometric2F1[-1/4, 1, 3/4, -Tan[c + d*x]^2]))/(
3*d)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c)),x, algorithm="fricas")
```

`[Out] Timed out`

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)\,(e\cot(dx+c))^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c)),x, algorithm="giac")
[Out] integrate((b*cot(d*x + c) + a)*(e*cot(d*x + c))^(3/2), x)
```

maple [A] time = 0.37, size = 363, normalized size = 1.47

$$-\frac{2b\,(e\cot(dx+c))^{\frac{3}{2}}}{3d}-\frac{2ae\sqrt{e\cot(dx+c)}}{d}+\frac{ae\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d}+\frac{ae\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\operatorname{arcta}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c)),x)
[Out] -2/3*b*(e*cot(d*x+c))^(3/2)/d-2*a*e*(e*cot(d*x+c))^(1/2)/d+1/4*a/d*e*(e^2)^
(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
)))+1/2*a/d*e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)+1)-1/2*a/d*e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)+1)+1/4/d*e^2*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d*e^2*b/(e^2)^(1/4)*2^(1/2)*arct
an(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*e^2*b/(e^2)^(1/4)*2^(1
/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.85, size = 221, normalized size = 0.89

$$\frac{\left(3\left(\frac{2\sqrt{2}\,(a+b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\,(a+b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,(a-b)\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+}\right.}{\sqrt{e}}\right.\right.}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*(3*(2*sqrt(2)*(a + b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/t
an(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a + b)*arctan(-1/2*sqrt(2)*(sqr
t(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a - b)*l
og(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqr
t(2)*(a - b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c)
)/sqrt(e))*e - 8*(3*a*e*sqrt(e/tan(d*x + c)) + b*(e/tan(d*x + c))^(3/2))/e)
*e/d
```

mupad [B] time = 1.40, size = 153, normalized size = 0.62

$$\frac{(-1)^{1/4}\,b\,e^{3/2}\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d}-\frac{2\,a\,e\,\sqrt{e\cot(c+d\,x)}}{d}-\frac{2\,b\,(e\cot(c+d\,x))^{3/2}}{3\,d}-\frac{(-1)^{1/4}\,b\,e^{3/2}\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{\cdots}}{\cdots}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)*(a + b*cot(c + d*x)),x)
```

```
[Out] ((-1)^(1/4)*b*e^(3/2)*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)))/d
- (2*a*e*(e*cot(c + d*x))^(1/2))/d - ((-1)^(1/4)*a*e^(3/2)*atan(((-1)^(1/4)
*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/d - ((-1)^(1/4)*a*e^(3/2)*atanh(((-1)
^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/d - (2*b*(e*cot(c + d*x))^(3/2)
)/(3*d) - ((-1)^(1/4)*b*e^(3/2)*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e
^(1/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cot(c+dx))^{\frac{3}{2}}\,(a+b\cot(c+dx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)*(a+b*cot(d*x+c)),x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)*(a + b*cot(c + d*x)), x)
```

3.52 $\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))\,dx$

Optimal. Leaf size=226

$$-\frac{\sqrt{e}\,(a+b)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{\sqrt{e}\,(a+b)\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx}\right.}{2\sqrt{2}\,d}$$

```
[Out] 1/2*(a-b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/d*2^(1/2)-
1/2*(a-b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/d*2^(1/2)-
1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/
2)/d*2^(1/2)+1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))
^(1/2))*e^(1/2)/d*2^(1/2)-2*b*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.17, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3528, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{\sqrt{e}\,(a+b)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{\sqrt{e}\,(a+b)\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx}\right.}{2\sqrt{2}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x]),x]
```

```
[Out] ((a - b)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[
2]*d) - ((a - b)*Sqrt[e]*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]
)/(Sqrt[2]*d) - (2*b*Sqrt[e*Cot[c + d*x]])/d - ((a + b)*Sqrt[e]*Log[Sqrt[e]
 + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d) + ((
a + b)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c +
d*x]]])/(2*Sqrt[2]*d)
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3528

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

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rubi steps

$$\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))\,dx = -\frac{2b\sqrt{e\cot(c+dx)}}{d} + \int \frac{-be+ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$$

$$= -\frac{2b\sqrt{e\cot(c+dx)}}{d} + \frac{2\,\mathrm{Subst}\left(\int \frac{be^2-aex^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d}$$

$$= -\frac{2b\sqrt{e\cot(c+dx)}}{d} - \frac{((a-b)e)\,\mathrm{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d} +$$

$$= -\frac{2b\sqrt{e\cot(c+dx)}}{d} - \frac{\left((a+b)\sqrt{e}\right)\mathrm{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\cot(\right.}{2\sqrt{2}\,d}$$

$$= -\frac{2b\sqrt{e\cot(c+dx)}}{d} - \frac{(a+b)\sqrt{e}\,\log\left(\sqrt{e}+\sqrt{e}\,\cot(c+dx)-\sqrt{2}\sqrt{e\,\mathrm{co}}\right.}{2\sqrt{2}\,d}$$

$$= \frac{(a-b)\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d} - \frac{(a-b)\sqrt{e}\,\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+}}{\sqrt{e}}\right.}{\sqrt{2}\,d}$$

Mathematica [C] time = 0.28, size = 155, normalized size = 0.69

$$-\frac{\sqrt{e\cot(c+dx)}\left(\sqrt{2}\,a\sqrt{\tan(c+dx)}\left(2\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)-2\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+dx)}+1\right)+\log\left(\mathrm{tan}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x]),x]
```

```
[Out] -1/4*(Sqrt[e*Cot[c + d*x]]*(8*b*Hypergeometric2F1[-1/4, 1, 3/4, -Tan[c + d*
x]^2] + Sqrt[2]*a*(2*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] - 2*ArcTan[1 +
Sqrt[2]*Sqrt[Tan[c + d*x]]] + Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c +
d*x]] - Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x]])*Sqrt[Tan[c + d*
x]]))/d
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)\sqrt{e\cot(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)*sqrt(e*cot(d*x + c)), x)
```

maple [A] time = 0.36, size = 337, normalized size = 1.49

$$-\frac{2b\sqrt{e\cot(dx+c)}}{d}+\frac{b\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d}+\frac{b\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c)),x)
```

```
[Out] -2*b*(e*cot(d*x+c))^(1/2)/d+1/4/d*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d*b*(e^2)^(1/4)*2^(1/2)*a
rctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*b*(e^2)^(1/4)*2^(1/
2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d*e*a/(e^2)^(1/4
)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(
1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-
1/2/d*e*a/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)+1)+1/2/d*e*a/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)+1)
```

maxima [A] time = 0.73, size = 199, normalized size = 0.88

$$-\frac{\left(\frac{2\sqrt{2}(a-b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}(a-b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}(a+b)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+}\right.}{\sqrt{e}}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/4*(2*sqrt(2)*(a - b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(
d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a - b)*arctan(-1/2*sqrt(2)*(sqrt(2
)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a + b)*log(
sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2
)*(a + b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/s
qrt(e) + 8*b*sqrt(e/tan(d*x + c))/e)*e/d
```

mupad [B] time = 0.73, size = 128, normalized size = 0.57

$$-\frac{2\,b\,\sqrt{e\cot\left(c+d\,x\right)}}{d}-\frac{{\left(-1\right)}^{1/4}\,a\,\sqrt{e}\,\left(\mathrm{atan}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)-\mathrm{atanh}\left(\frac{{\left(-1\right)}^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)\right)}{d}-\frac{{\left(-1\right)}^{1/4}\,b\,\sqrt{e}\,\mathrm{atan}\left(\frac{(-1}{}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)*(a + b*cot(c + d*x)),x)
```

```
[Out] - (2*b*(e*cot(c + d*x))^(1/2))/d - ((-1)^(1/4)*b*e^(1/2)*atan(((-1)^(1/4)*(
e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/d - ((-1)^(1/4)*b*e^(1/2)*atanh(((-1)^(
1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/d - ((-1)^(1/4)*a*e^(1/2)*(atan((
(-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2)) - atanh(((-1)^(1/4)*(e*cot(c +
d*x))^(1/2))/e^(1/2))))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\cot\left(c+dx\right)}\,\left(a+b\cot\left(c+dx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)*(a+b*cot(d*x+c)),x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))*(a + b*cot(c + d*x)), x)
```

3.53 $\int \frac{a+b\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$

Optimal. Leaf size=208

$$\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}-\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right.}{2\sqrt{2}\,d\sqrt{e}}$$

```
[Out] 1/2*(a+b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d*2^(1/2)/e^(1/2)-
1/2*(a+b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d*2^(1/2)/e^(1/2)+
1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(
1/2)/e^(1/2)-1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))
^(1/2))/d*2^(1/2)/e^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3534, 1168, 1162, 617, 204, 1165, 628}

$$\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}-\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right.}{2\sqrt{2}\,d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] ((a + b)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*Sqr
t[e]) - ((a + b)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[
2]*d*Sqrt[e]) + ((a - b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[
e*Cot[c + d*x]]])/(2*Sqrt[2]*d*Sqrt[e]) - ((a - b)*Log[Sqrt[e] + Sqrt[e]*Co
t[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*Sqrt[e])
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rubi steps

$$\int \frac{a+b\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx = \frac{2\,\text{Subst}\left(\int \frac{-ae-bx^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d}$$

$$= -\frac{(a-b)\,\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{d} - \frac{(a+b)\,\text{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c\right.}{d}$$

$$= -\frac{(a+b)\,\text{Subst}\left(\int \frac{1}{e-\sqrt{2}\sqrt{e}\,x+x^2}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{2d} - \frac{(a+b)\,\text{Subst}\left(\int \frac{1}{e+\sqrt{2}\sqrt{e}\,x+x^2}\,d\right.}{2d}$$

$$= \frac{(a-b)\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}\right)}{2\sqrt{2}\,d\sqrt{e}} - \frac{(a-b)\log\left(\sqrt{e}+\sqrt{e}\cot(c\right.}{2\sqrt{2}}$$

$$= \frac{(a+b)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d\sqrt{e}} - \frac{(a+b)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d\sqrt{e}} + \frac{(a-b)\log\left(\sqrt{\right.}{}$$

Mathematica [C] time = 0.22, size = 166, normalized size = 0.80

$$\frac{8a\tan^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\tan^2(c+dx)\right)+3\sqrt{2}\,b\left(-2\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)+2\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+\right.\right.}{12d\sqrt{\tan(c+dx)}\sqrt{e\,\text{co}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (3*Sqrt[2]*b*(-2*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] + 2*ArcTan[1 + Sqrt
[2]*Sqrt[Tan[c + d*x]]] - Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x]
] + Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x]]) + 8*a*Hypergeometri
c2F1[3/4, 1, 7/4, -Tan[c + d*x]^2]*Tan[c + d*x]^(3/2))/(12*d*Sqrt[e*Cot[c +
 d*x]]*Sqrt[Tan[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)+a}{\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)/sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.41, size = 327, normalized size = 1.57

$$-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4de}-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2de}+\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x)
```

```
[Out] -1/4*a/d/e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2)))-1/2*a/d/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)+1/2*a/d/e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x
+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/2/d*b/(e^2)^(1/4)*2^(
1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*b/(e^2)^(1/4)
*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.75, size = 180, normalized size = 0.87

$$-\frac{\frac{2\sqrt{2}(a+b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}(a+b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}(a-b)\log\left(\sqrt{2}\,\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/4*(2*sqrt(2)*(a + b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(
d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a + b)*arctan(-1/2*sqrt(2)*(sqrt(2
```

```
)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a - b)*log(
sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2
)*(a - b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/s
qrt(e))/d
```

mupad [B] time = 0.65, size = 118, normalized size = 0.57

$$\frac{(-1)^{1/4}\,b\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,\sqrt{e}}-\frac{(-1)^{1/4}\,b\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,\sqrt{e}}+\frac{(-1)^{1/4}\,a\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)\,1\mathrm{i}}{d\,\sqrt{e}}+\frac{(-1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))/(e*cot(c + d*x))^(1/2),x)
```

```
[Out] ((-1)^(1/4)*a*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/(d*e^(1
/2)) + ((-1)^(1/4)*a*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)
/(d*e^(1/2)) - ((-1)^(1/4)*b*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/
2)))/(d*e^(1/2)) + ((-1)^(1/4)*b*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/
e^(1/2)))/(d*e^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))**(1/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))/sqrt(e*cot(c + d*x)), x)
```

3.54 $\int \frac{a+b\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=229

$$\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}}-\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}}$$

```
[Out] -1/2*(a-b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(3/2)*2^(1/2)
+1/2*(a-b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(3/2)*2^(1/2)
+1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^
(3/2)*2^(1/2)-1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c)
)^(1/2))/d/e^(3/2)*2^(1/2)+2*a/d/e/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3529, 3534, 1168, 1162, 617, 204, 1165, 628}

$$\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}}-\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] -(((a - b)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e
^(3/2))) + ((a - b)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sq
rt[2]*d*e^(3/2)) + (2*a)/(d*e*Sqrt[e*Cot[c + d*x]]) + ((a + b)*Log[Sqrt[e]
+ Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(3/2
)) - ((a + b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d
*x]]])/(2*Sqrt[2]*d*e^(3/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rubi steps

$$\int \frac{a+b\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx = \frac{2a}{de\sqrt{e\cot(c+dx)}} + \frac{\int \frac{be-ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^2}$$
$$= \frac{2a}{de\sqrt{e\cot(c+dx)}} + \frac{2\,\text{Subst}\left(\int \frac{-be^2+aex^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{de^2}$$
$$= \frac{2a}{de\sqrt{e\cot(c+dx)}} + \frac{(a-b)\,\text{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{de} - \frac{(a+b)\,\text{Subst}\left(\int \frac{e-}{e^2}\right.}{}$$
$$= \frac{2a}{de\sqrt{e\cot(c+dx)}} + \frac{(a+b)\,\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{2\sqrt{2}\,de^{3/2}} + \frac{(a+b)\,\text{Sub}}{}$$
$$= \frac{2a}{de\sqrt{e\cot(c+dx)}} + \frac{(a+b)\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}\right)}{2\sqrt{2}\,de^{3/2}} - \frac{(a+b)\,\text{l}}{}$$
$$= -\frac{(a-b)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{3/2}} + \frac{(a-b)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{3/2}} + \frac{2a}{de\sqrt{e\cot(c+}}$$

Mathematica [C] time = 0.36, size = 196, normalized size = 0.86

$$\frac{3a\left(2\left(\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)-\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+dx)}+1\right)\right)+8\sqrt{\tan(c+dx)}+\sqrt{2}\log\left(\tan(c-\right.\right.}{12d\tan^{\frac{3}{2}}(c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (3*a*(2*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] - Sqrt[2]*ArcTan[1
+ Sqrt[2]*Sqrt[Tan[c + d*x]]]) + Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]
 + Tan[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x
]] + 8*Sqrt[Tan[c + d*x]]) + 8*b*Hypergeometric2F1[3/4, 1, 7/4, -Tan[c + d*
x]^2]*Tan[c + d*x]^(3/2))/(12*d*(e*Cot[c + d*x])^(3/2)*Tan[c + d*x]^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)+a}{(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)/(e*cot(d*x + c))^(3/2), x)
```

maple [A] time = 0.37, size = 355, normalized size = 1.55

$$-\frac{b\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4d\,e^{2}}-\frac{b\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{2d\,e^{2}}+\frac{b\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\mathrm{arctan}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x)
```

```
[Out] -1/4/d/e^2*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
*2^(1/2)+(e^2)^(1/2)))-1/2/d/e^2*b*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d/e^2*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1
/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4*a/d/e*2^(1/2)/(e^2)^(1/4)*ln((e
*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*
x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2*a/d/e*2^(1/
2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2*a/d/e
*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2*
a/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.69, size = 204, normalized size = 0.89

$$\frac{e\left(\frac{\frac{2\sqrt{2}(a-b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}(a-b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}(a+b)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}+\frac{\sqrt{2}(a+b)\log}{}}{e^{2}}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*e*((2*sqrt(2)*(a - b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/ta
n(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a - b)*arctan(-1/2*sqrt(2)*(sqrt
(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a + b)*lo
g(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt
(2)*(a + b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))
/sqrt(e))/e^2 + 8*a/(e^2*sqrt(e/tan(d*x + c))))/d
```

mupad [B] time = 0.80, size = 137, normalized size = 0.60

$$\frac{2a}{d\,e\,\sqrt{e\cot(c+d\,x)}}+\frac{(-1)^{1/4}\,a\,\mathrm{atan}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,e^{3/2}}-\frac{(-1)^{1/4}\,a\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\,\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,e^{3/2}}+\frac{(-1)^{1/4}\,b\,\mathrm{atan}\left(\frac{(-1)^{1/4}}{\right.}}{d\,e^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))/(e*cot(c + d*x))^(3/2),x)
```

```
[Out] (2*a)/(d*e*(e*cot(c + d*x))^(1/2)) + ((-1)^(1/4)*a*atan(((-1)^(1/4)*(e*cot(
c + d*x))^(1/2))/e^(1/2)))/(d*e^(3/2)) - ((-1)^(1/4)*a*atanh(((-1)^(1/4)*(e
*cot(c + d*x))^(1/2))/e^(1/2)))/(d*e^(3/2)) + ((-1)^(1/4)*b*atan(((-1)^(1/4
)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/(d*e^(3/2)) + ((-1)^(1/4)*b*atanh(((
-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/(d*e^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b\cot(c + dx)}{(e\cot(c + dx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))**(3/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))/(e*cot(c + d*x))**(3/2), x)
```

3.55 $\int \frac{a+b\cot(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=252

$$-\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{5/2}}+\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{}\right.}{2\sqrt{2}de^{5/2}}$$

```
[Out] 2/3*a/d/e/(e*cot(d*x+c))^(3/2)-1/2*(a+b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1
/2)/e^(1/2))/d/e^(5/2)*2^(1/2)+1/2*(a+b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1
/2)/e^(1/2))/d/e^(5/2)*2^(1/2)-1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1
/2)*(e*cot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)+1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)
*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)+2*b/d/e^2/(e*cot(d
*x+c))^(1/2)
```

Rubi [A] time = 0.26, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {3529, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{5/2}}+\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{}\right.}{2\sqrt{2}de^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] -(((a + b)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e
^(5/2))) + ((a + b)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sq
rt[2]*d*e^(5/2)) + (2*a)/(3*d*e*(e*Cot[c + d*x])^(3/2)) + (2*b)/(d*e^2*Sqrt
[e*Cot[c + d*x]]) - ((a - b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*S
qrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(5/2)) + ((a - b)*Log[Sqrt[e] + Sqrt[e
]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(5/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rubi steps

$$\int \frac{a+b\cot(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx = \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{\int \frac{be-ae\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{e^2}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2b}{de^2\sqrt{e\cot(c+dx)}} + \frac{\int \frac{-ae^2-be^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^4}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2b}{de^2\sqrt{e\cot(c+dx)}} + \frac{2\,\mathrm{Subst}\left(\int \frac{ae^3+be^2x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right.}{de^4}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2b}{de^2\sqrt{e\cot(c+dx)}} + \frac{(a-b)\,\mathrm{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+d\right.}{de^2}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2b}{de^2\sqrt{e\cot(c+dx)}} - \frac{(a-b)\,\mathrm{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\,c\right.}{2\sqrt{2}de^{5/2}}$$

$$= \frac{2a}{3de(e\cot(c+dx))^{3/2}} + \frac{2b}{de^2\sqrt{e\cot(c+dx)}} - \frac{(a-b)\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\right.}{2\sqrt{2}de^{5/2}}$$

$$= -\frac{(a+b)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}de^{5/2}} + \frac{(a+b)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}de^{5/2}} + \frac{2a}{3de(e\cot(c}$$

Mathematica [C] time = 0.76, size = 196, normalized size = 0.78

$$\frac{3b\left(2\sqrt{2}\tan^{-1}\left(1-\sqrt{2}\sqrt{\tan(c+dx)}\right)-2\sqrt{2}\tan^{-1}\left(\sqrt{2}\sqrt{\tan(c+dx)}+1\right)+8\sqrt{\tan(c+dx)}+\sqrt{2}\log\left(\tan(c\right.}{12d\tan}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (3*b*(2*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]] - 2*Sqrt[2]*ArcTan[1
 + Sqrt[2]*Sqrt[Tan[c + d*x]]] + Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Tan[c + d*x]]
 + Tan[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Tan[c + d*x]] + Tan[c + d*x
]] + 8*Sqrt[Tan[c + d*x]]) - 8*a*(-1 + Hypergeometric2F1[3/4, 1, 7/4, -Tan[
c + d*x]^2])*Tan[c + d*x]^(3/2))/(12*d*(e*Cot[c + d*x])^(5/2)*Tan[c + d*x]^
(5/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)+a}{(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)/(e*cot(d*x + c))^(5/2), x)
```

maple [A] time = 0.48, size = 374, normalized size = 1.48

$$\frac{a\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{4d\,e^3}+\frac{a\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{2d\,e^3}-\frac{a\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\right.}{2d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x)
```

```
[Out] 1/4/d/e^3*a*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*
2^(1/2)+(e^2)^(1/2)))+1/2/d/e^3*a*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^
(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d/e^3*a*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/e^2*b/(e^2)^(1/4)*2^(1/2)*ln((
e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d
*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d/e^2*b/(e
^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d/
e^2*b/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)+2/3*a/d/e/(e*cot(d*x+c))^(3/2)+2*b/d/e^2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.70, size = 220, normalized size = 0.87

$$\frac{e\left(\frac{3\left(\frac{2\sqrt{2}(a+b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}(a+b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}(a-b)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e+\frac{e}{\tan(dx+c)}\right)}{\sqrt{e}}-\frac{\sqrt{2}(a-b)\cdots}{}\right)}{e^3}\cdots\right)}{12d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/12*e*(3*(2*sqrt(2)*(a + b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e
/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a + b)*arctan(-1/2*sqrt(2)*(s
qrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a - b)
*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - s
qrt(2)*(a - b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x +
c))/sqrt(e))/e^3 + 8*(a*e + 3*b*e/tan(d*x + c))/(e^3*(e/tan(d*x + c))^(3/2)
))/d
```

mupad [B] time = 1.24, size = 158, normalized size = 0.63

$$\frac{2a}{3de\,(e\cot(c+d\,x))^{3/2}}+\frac{2b}{d\,e^2\sqrt{e\cot(c+d\,x)}}+\frac{(-1)^{1/4}\,b\,\mathrm{atan}\left(\frac{(-1)^{1/4}\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,e^{5/2}}-\frac{(-1)^{1/4}\,b\,\mathrm{atanh}\left(\frac{(-1)^{1/4}\sqrt{e\cot(c+d\,x)}}{\sqrt{e}}\right)}{d\,e^{5/2}}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))/(e*cot(c + d*x))^(5/2),x)
```

```
[Out] (2*a)/(3*d*e*(e*cot(c + d*x))^(3/2)) + (2*b)/(d*e^2*(e*cot(c + d*x))^(1/2))
 - ((-1)^(1/4)*a*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*1i)/(d*e
^(5/2)) - ((-1)^(1/4)*a*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^(1/2))*
1i)/(d*e^(5/2)) + ((-1)^(1/4)*b*atan(((-1)^(1/4)*(e*cot(c + d*x))^(1/2))/e^
(1/2)))/(d*e^(5/2)) - ((-1)^(1/4)*b*atanh(((-1)^(1/4)*(e*cot(c + d*x))^(1/2
))/e^(1/2)))/(d*e^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\cot(c+dx)}{(e\cot(c+dx))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))/(e*cot(d*x+c))**(5/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))/(e*cot(c + d*x))**(5/2), x)
```

3.56 $\int (e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^2\,dx$

Optimal. Leaf size=317

$$-\frac{e^{3/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d}+\frac{e^{3/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)\right.}{2\sqrt{2}d}$$

```
[Out] -4/3*a*b*(e*cot(d*x+c))^(3/2)/d-2/5*b^2*(e*cot(d*x+c))^(5/2)/d/e-1/2*(a^2+2
*a*b-b^2)*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d*2^(1/2)+
1/2*(a^2+2*a*b-b^2)*e^(3/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/
d*2^(1/2)-1/4*(a^2-2*a*b-b^2)*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)
*(e*cot(d*x+c))^(1/2))/d*2^(1/2)+1/4*(a^2-2*a*b-b^2)*e^(3/2)*ln(e^(1/2)+cot
(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)-2*(a^2-b^2)*e*(e*co
t(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.33, antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {3543, 3528, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{e^{3/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d}+\frac{e^{3/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)\right.}{2\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -(((a^2 + 2*a*b - b^2)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sq
rt[e]])/(Sqrt[2]*d)) + ((a^2 + 2*a*b - b^2)*e^(3/2)*ArcTan[1 + (Sqrt[2]*Sqr
t[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d) - (2*(a^2 - b^2)*e*Sqrt[e*Cot[c +
d*x]])/d - (4*a*b*(e*Cot[c + d*x])^(3/2))/(3*d) - (2*b^2*(e*Cot[c + d*x])^(
5/2))/(5*d*e) - ((a^2 - 2*a*b - b^2)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c +
d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d) + ((a^2 - 2*a*b - b^2)*
e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])
/(2*Sqrt[2]*d)
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3528

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

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
```

```
NeQ[c^2 + d^2, 0]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int (e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^2\,dx = -\frac{2b^2(e\cot(c+dx))^{5/2}}{5de} + \int (e\cot(c+dx))^{3/2}\left(a^2-b^2+2ab\cot(c+\right.$$

$$= -\frac{4ab(e\cot(c+dx))^{3/2}}{3d} - \frac{2b^2(e\cot(c+dx))^{5/2}}{5de} + \int \sqrt{e\cot(c+dx)}\ ($$

$$= -\frac{2\left(a^2-b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{4ab(e\cot(c+dx))^{3/2}}{3d} - \frac{2b^2(e\cot(c}{5de}$$

$$= -\frac{2\left(a^2-b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{4ab(e\cot(c+dx))^{3/2}}{3d} - \frac{2b^2(e\cot(c}{5de}$$

$$= -\frac{2\left(a^2-b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{4ab(e\cot(c+dx))^{3/2}}{3d} - \frac{2b^2(e\cot(c}{5de}$$

$$= -\frac{2\left(a^2-b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{4ab(e\cot(c+dx))^{3/2}}{3d} - \frac{2b^2(e\cot(c}{5de}$$

$$= -\frac{2\left(a^2-b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{4ab(e\cot(c+dx))^{3/2}}{3d} - \frac{2b^2(e\cot(c}{5de}$$

$$= -\frac{\left(a^2+2ab-b^2\right)e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d} + \frac{\left(a^2+2ab-b^2\right)e}{}$$

Mathematica [C] time = 1.98, size = 224, normalized size = 0.71

$$-\frac{(e\cot(c+dx))^{3/2}\left(\frac{1}{4}\left(a^2-b^2\right)\left(8\sqrt{\cot(c+dx)}+\sqrt{2}\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-\sqrt{2}\log\left(\cot(c\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -(((e*Cot[c + d*x])^(3/2)*((2*b^2*Cot[c + d*x]^(5/2))/5 - (4*a*b*Cot[c + d*
x]^(3/2)*(-1 + Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2]))/3 + ((a^2
- b^2)*(2*Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*Sqrt[2]*ArcTan
[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 8*Sqrt[Cot[c + d*x]] + Sqrt[2]*Log[1 - S
qrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Co
t[c + d*x]] + Cot[c + d*x]]))/4))/(d*Cot[c + d*x]^(3/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot (dx+c)+a)^2 (e\cot (dx+c))^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^2*(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.65, size = 581, normalized size = 1.83

$$-\frac{2b^2 (e\cot (dx+c))^{\frac{5}{2}}}{5de}-\frac{4ab\,(e\cot (dx+c))^{\frac{3}{2}}}{3d}-\frac{2e\,a^2\sqrt{e\cot (dx+c)}}{d}+\frac{2e\,b^2\sqrt{e\cot (dx+c)}}{d}-\frac{e\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \arctan\left(-\frac{\sqrt{\ }}{}\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^2,x)
```

```
[Out] -2/5*b^2*(e*cot(d*x+c))^(5/2)/d/e-4/3*a*b*(e*cot(d*x+c))^(3/2)/d-2*e/d*a^2*
(e*cot(d*x+c))^(1/2)+2*e/d*b^2*(e*cot(d*x+c))^(1/2)-1/2*e/d*(e^2)^(1/4)*2^(
1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2*e/d*(e^2)^
(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/4*e
```

```
/d*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^
(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(
e^2)^(1/2)))*a^2-1/4*e/d*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2+1/2*e/d*(e^2)^(1/4)*2^(1/2)*arctan(2
^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2*e/d*(e^2)^(1/4)*2^(1/2)*
arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/2*e^2/d*a*b/(e^2)^
(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
)))+e^2/d*a*b/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)+1)-e^2/d*a*b/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)+1)
```

maxima [A] time = 0.58, size = 287, normalized size = 0.91

$$\left(15\left(\frac{2\sqrt{2}\left(a^2+2ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^2+2ab-b^2\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{\right.}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/60*(15*(2*sqrt(2)*(a^2 + 2*a*b - b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e)
 + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^2 + 2*a*b - b^2)
*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sq
rt(e) + sqrt(2)*(a^2 - 2*a*b - b^2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)
) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(a^2 - 2*a*b - b^2)*log(-sqrt(2)*
sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))*e - 8*(10*a*b*e
*(e/tan(d*x + c))^(3/2) + 3*b^2*(e/tan(d*x + c))^(5/2) + 15*(a^2 - b^2)*e^2
*sqrt(e/tan(d*x + c)))/e^2)*e/d
```

mupad [B] time = 2.47, size = 1274, normalized size = 4.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)*(a + b*cot(c + d*x))^2,x)
```

```
[Out] atan((a^4*e^6*(e*cot(c + d*x))^(1/2)*((a*b^3*e^3)/d^2 - (b^4*e^3*1i)/(4*d^2
) - (a^4*e^3*1i)/(4*d^2) - (a^3*b*e^3)/d^2 + (a^2*b^2*e^3*3i)/(2*d^2))^(1/2
)*32i)/((a^6*e^8*16i)/d - (b^6*e^8*16i)/d + (32*a*b^5*e^8)/d + (32*a^5*b*e^
```

```
8)/d + (a^2*b^4*e^8*112i)/d - (192*a^3*b^3*e^8)/d - (a^4*b^2*e^8*112i)/d) +
 (b^4*e^6*(e*cot(c + d*x))^(1/2)*((a*b^3*e^3)/d^2 - (b^4*e^3*1i)/(4*d^2) -
(a^4*e^3*1i)/(4*d^2) - (a^3*b*e^3)/d^2 + (a^2*b^2*e^3*3i)/(2*d^2))^(1/2)*32
i)/((a^6*e^8*16i)/d - (b^6*e^8*16i)/d + (32*a*b^5*e^8)/d + (32*a^5*b*e^8)/d
 + (a^2*b^4*e^8*112i)/d - (192*a^3*b^3*e^8)/d - (a^4*b^2*e^8*112i)/d) - (a^
2*b^2*e^6*(e*cot(c + d*x))^(1/2)*((a*b^3*e^3)/d^2 - (b^4*e^3*1i)/(4*d^2) -
(a^4*e^3*1i)/(4*d^2) - (a^3*b*e^3)/d^2 + (a^2*b^2*e^3*3i)/(2*d^2))^(1/2)*19
2i)/((a^6*e^8*16i)/d - (b^6*e^8*16i)/d + (32*a*b^5*e^8)/d + (32*a^5*b*e^8)/
d + (a^2*b^4*e^8*112i)/d - (192*a^3*b^3*e^8)/d - (a^4*b^2*e^8*112i)/d))*(-(
a^4*e^3*1i + b^4*e^3*1i - 4*a*b^3*e^3 + 4*a^3*b*e^3 - a^2*b^2*e^3*6i)/(4*d^
2))^(1/2)*2i + atan((a^4*e^6*(e*cot(c + d*x))^(1/2)*((a^4*e^3*1i)/(4*d^2) +
 (b^4*e^3*1i)/(4*d^2) + (a*b^3*e^3)/d^2 - (a^3*b*e^3)/d^2 - (a^2*b^2*e^3*3i
)/(2*d^2))^(1/2)*32i)/((b^6*e^8*16i)/d - (a^6*e^8*16i)/d + (32*a*b^5*e^8)/d
 + (32*a^5*b*e^8)/d - (a^2*b^4*e^8*112i)/d - (192*a^3*b^3*e^8)/d + (a^4*b^2
*e^8*112i)/d) + (b^4*e^6*(e*cot(c + d*x))^(1/2)*((a^4*e^3*1i)/(4*d^2) + (b^
4*e^3*1i)/(4*d^2) + (a*b^3*e^3)/d^2 - (a^3*b*e^3)/d^2 - (a^2*b^2*e^3*3i)/(2
*d^2))^(1/2)*32i)/((b^6*e^8*16i)/d - (a^6*e^8*16i)/d + (32*a*b^5*e^8)/d + (
32*a^5*b*e^8)/d - (a^2*b^4*e^8*112i)/d - (192*a^3*b^3*e^8)/d + (a^4*b^2*e^8
*112i)/d) - (a^2*b^2*e^6*(e*cot(c + d*x))^(1/2)*((a^4*e^3*1i)/(4*d^2) + (b^
4*e^3*1i)/(4*d^2) + (a*b^3*e^3)/d^2 - (a^3*b*e^3)/d^2 - (a^2*b^2*e^3*3i)/(2
*d^2))^(1/2)*192i)/((b^6*e^8*16i)/d - (a^6*e^8*16i)/d + (32*a*b^5*e^8)/d +
(32*a^5*b*e^8)/d - (a^2*b^4*e^8*112i)/d - (192*a^3*b^3*e^8)/d + (a^4*b^2*e^
8*112i)/d))*((a^4*e^3*1i + b^4*e^3*1i + 4*a*b^3*e^3 - 4*a^3*b*e^3 - a^2*b^2
*e^3*6i)/(4*d^2))^(1/2)*2i - (e*cot(c + d*x))^(1/2)*((2*a^2*e)/d - (2*b^2*e
)/d) - (2*b^2*(e*cot(c + d*x))^(5/2))/(5*d*e) - (4*a*b*(e*cot(c + d*x))^(3/
2))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cot(c+dx))^{\frac{3}{2}} (a+b\cot(c+dx))^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)*(a+b*cot(d*x+c))**2,x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)*(a + b*cot(c + d*x))**2, x)
```

3.57 $\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2\,dx$

Optimal. Leaf size=288

$$-\frac{\sqrt{e}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{\sqrt{e}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)\right.}{2\sqrt{2}\,d}$$

```
[Out] -2/3*b^2*(e*cot(d*x+c))^(3/2)/d/e+1/2*(a^2-2*a*b-b^2)*arctan(1-2^(1/2)*(e*c
ot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/d*2^(1/2)-1/2*(a^2-2*a*b-b^2)*arctan(1+2^
(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/d*2^(1/2)-1/4*(a^2+2*a*b-b^2)*l
n(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2
)+1/4*(a^2+2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^
(1/2))*e^(1/2)/d*2^(1/2)-4*a*b*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.27, antiderivative size = 288, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {3543, 3528, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{\sqrt{e}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{\sqrt{e}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)\right.}{2\sqrt{2}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^2,x]
```

```
[Out] ((a^2 - 2*a*b - b^2)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt
[e]])/(Sqrt[2]*d) - ((a^2 - 2*a*b - b^2)*Sqrt[e]*ArcTan[1 + (Sqrt[2]*Sqrt[e
*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d) - (4*a*b*Sqrt[e*Cot[c + d*x]])/d - (2
*b^2*(e*Cot[c + d*x])^(3/2))/(3*d*e) - ((a^2 + 2*a*b - b^2)*Sqrt[e]*Log[Sqr
t[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d)
+ ((a^2 + 2*a*b - b^2)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]
*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d)
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3528

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

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2\,dx = -\frac{2b^2(e\cot(c+dx))^{3/2}}{3de} + \int \sqrt{e\cot(c+dx)}\,\left(a^2-b^2+2ab\cot(c+dx\right.$$

$$= -\frac{4ab\sqrt{e\cot(c+dx)}}{d} - \frac{2b^2(e\cot(c+dx))^{3/2}}{3de} + \int \frac{-2abe+\left(a^2-b^2\right)e}{\sqrt{e\cot(c+}}$$

$$= -\frac{4ab\sqrt{e\cot(c+dx)}}{d} - \frac{2b^2(e\cot(c+dx))^{3/2}}{3de} + \frac{2\,\mathrm{Subst}\left(\int \frac{2abe^2-\left(a^2-b\right.}{e^2+x^4}\right.}{}$$

$$= -\frac{4ab\sqrt{e\cot(c+dx)}}{d} - \frac{2b^2(e\cot(c+dx))^{3/2}}{3de} - \frac{\left(\left(a^2-2ab-b^2\right)e\right)\mathrm{Su}}{}$$

$$= -\frac{4ab\sqrt{e\cot(c+dx)}}{d} - \frac{2b^2(e\cot(c+dx))^{3/2}}{3de} - \frac{\left(\left(a^2+2ab-b^2\right)\sqrt{e}\right)}{}$$

$$= -\frac{4ab\sqrt{e\cot(c+dx)}}{d} - \frac{2b^2(e\cot(c+dx))^{3/2}}{3de} - \frac{\left(a^2+2ab-b^2\right)\sqrt{e}\,\mathrm{lo}}{}$$

$$= \frac{\left(a^2-2ab-b^2\right)\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d} - \frac{\left(a^2-2ab-b^2\right)\sqrt{e}\,\mathrm{t}}{}$$

Mathematica [C] time = 0.57, size = 220, normalized size = 0.76

$$-\frac{\sqrt{e\cot(c+dx)}\left(4\left(a^2-b^2\right)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)+b\left(24a\sqrt{\cot(c+dx)}+3\sqrt{2}\,a\log\left(\cot(c\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -1/6*(Sqrt[e*Cot[c + d*x]]*(4*(a^2 - b^2)*Cot[c + d*x]^(3/2)*Hypergeometric
2F1[3/4, 1, 7/4, -Cot[c + d*x]^2] + b*(6*Sqrt[2]*a*ArcTan[1 - Sqrt[2]*Sqrt[
```

```
Cot[c + d*x]]] - 6*Sqrt[2]*a*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 24*a*
Sqrt[Cot[c + d*x]] + 4*b*Cot[c + d*x]^(3/2) + 3*Sqrt[2]*a*Log[1 - Sqrt[2]*S
qrt[Cot[c + d*x]] + Cot[c + d*x]] - 3*Sqrt[2]*a*Log[1 + Sqrt[2]*Sqrt[Cot[c
+ d*x]] + Cot[c + d*x]]]))/(d*Sqrt[Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)^2\sqrt{e\cot(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^2*sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.54, size = 534, normalized size = 1.85

$$-\frac{2b^2(e\cot(dx+c))^{\frac{3}{2}}}{3de}-\frac{4ab\sqrt{e\cot(dx+c)}}{d}+\frac{ab\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{e^2}}\right)}{2d}+\frac{ab\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \mathrm{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^2,x)
```

```
[Out] -2/3*b^2*(e*cot(d*x+c))^(3/2)/d/e-4*a*b*(e*cot(d*x+c))^(1/2)/d+1/2/d*a*b*(e
^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)
+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^
(1/2)))+1/d*a*b*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)+1)-1/d*a*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)+1)-1/4*e/d*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2+1/4*e/d*2^(1/2)/(e^2)^(1/4)*ln((e*co
t(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c
)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2+1/2*e/d*2^(1/2
```

```
)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2*e
/d*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*
b^2-1/2*e/d*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)*a^2+1/2*e/d*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)*b^2
```

maxima [A] time = 0.45, size = 257, normalized size = 0.89

$$-\frac{\left(\frac{6\sqrt{2}\left(a^2-2ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{6\sqrt{2}\left(a^2-2ab-b^2\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{3\sqrt{2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{2}\cdots\right.}{\cdots}\right.}{12d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/12*(6*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) +
2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 6*sqrt(2)*(a^2 - 2*a*b - b^2)*ar
ctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(
e) - 3*sqrt(2)*(a^2 + 2*a*b - b^2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c))
 + e + e/tan(d*x + c))/sqrt(e) + 3*sqrt(2)*(a^2 + 2*a*b - b^2)*log(-sqrt(2)
*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + 8*(6*a*b*e*sq
rt(e/tan(d*x + c)) + b^2*(e/tan(d*x + c))^(3/2))/e^2)*e/d
```

mupad [B] time = 1.21, size = 1157, normalized size = 4.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)*(a + b*cot(c + d*x))^2,x)
```

```
[Out] atan((a^4*e^4*(e*cot(c + d*x))^(1/2)*((a^4*e*1i)/(4*d^2) + (b^4*e*1i)/(4*d^
2) - (a^2*b^2*e*3i)/(2*d^2) - (a*b^3*e)/d^2 + (a^3*b*e)/d^2)^(1/2)*32i)/((1
6*b^6*e^5)/d - (16*a^6*e^5)/d + (a*b^5*e^5*32i)/d + (a^5*b*e^5*32i)/d - (11
2*a^2*b^4*e^5)/d - (a^3*b^3*e^5*192i)/d + (112*a^4*b^2*e^5)/d) + (b^4*e^4*(
e*cot(c + d*x))^(1/2)*((a^4*e*1i)/(4*d^2) + (b^4*e*1i)/(4*d^2) - (a^2*b^2*e
*3i)/(2*d^2) - (a*b^3*e)/d^2 + (a^3*b*e)/d^2)^(1/2)*32i)/((16*b^6*e^5)/d -
(16*a^6*e^5)/d + (a*b^5*e^5*32i)/d + (a^5*b*e^5*32i)/d - (112*a^2*b^4*e^5)/
d - (a^3*b^3*e^5*192i)/d + (112*a^4*b^2*e^5)/d) - (a^2*b^2*e^4*(e*cot(c + d
*x))^(1/2)*((a^4*e*1i)/(4*d^2) + (b^4*e*1i)/(4*d^2) - (a^2*b^2*e*3i)/(2*d^2
) - (a*b^3*e)/d^2 + (a^3*b*e)/d^2)^(1/2)*192i)/((16*b^6*e^5)/d - (16*a^6*e^
5)/d + (a*b^5*e^5*32i)/d + (a^5*b*e^5*32i)/d - (112*a^2*b^4*e^5)/d - (a^3*b
```

```
^3*e^5*192i)/d + (112*a^4*b^2*e^5)/d))*((a^4*e*1i + b^4*e*1i - a^2*b^2*e*6i
 - 4*a*b^3*e + 4*a^3*b*e)/(4*d^2))^(1/2)*2i - atan((a^4*e^4*(e*cot(c + d*x)
)^(1/2)*((a^2*b^2*e*3i)/(2*d^2) - (b^4*e*1i)/(4*d^2) - (a^4*e*1i)/(4*d^2) -
 (a*b^3*e)/d^2 + (a^3*b*e)/d^2)^(1/2)*32i)/((16*a^6*e^5)/d - (16*b^6*e^5)/d
 + (a*b^5*e^5*32i)/d + (a^5*b*e^5*32i)/d + (112*a^2*b^4*e^5)/d - (a^3*b^3*e
^5*192i)/d - (112*a^4*b^2*e^5)/d) + (b^4*e^4*(e*cot(c + d*x))^(1/2)*((a^2*b
^2*e*3i)/(2*d^2) - (b^4*e*1i)/(4*d^2) - (a^4*e*1i)/(4*d^2) - (a*b^3*e)/d^2
+ (a^3*b*e)/d^2)^(1/2)*32i)/((16*a^6*e^5)/d - (16*b^6*e^5)/d + (a*b^5*e^5*3
2i)/d + (a^5*b*e^5*32i)/d + (112*a^2*b^4*e^5)/d - (a^3*b^3*e^5*192i)/d - (1
12*a^4*b^2*e^5)/d) - (a^2*b^2*e^4*(e*cot(c + d*x))^(1/2)*((a^2*b^2*e*3i)/(2
*d^2) - (b^4*e*1i)/(4*d^2) - (a^4*e*1i)/(4*d^2) - (a*b^3*e)/d^2 + (a^3*b*e)
/d^2)^(1/2)*192i)/((16*a^6*e^5)/d - (16*b^6*e^5)/d + (a*b^5*e^5*32i)/d + (a
^5*b*e^5*32i)/d + (112*a^2*b^4*e^5)/d - (a^3*b^3*e^5*192i)/d - (112*a^4*b^2
*e^5)/d))*(-(a^4*e*1i + b^4*e*1i - a^2*b^2*e*6i + 4*a*b^3*e - 4*a^3*b*e)/(4
*d^2))^(1/2)*2i - (2*b^2*(e*cot(c + d*x))^(3/2))/(3*d*e) - (4*a*b*(e*cot(c
+ d*x))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)*(a+b*cot(d*x+c))**2,x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))*(a + b*cot(c + d*x))**2, x)
```

3.58 $\int \frac{(a+b\cot(c+dx))^2}{\sqrt{e\cot(c+dx)}}\,dx$

Optimal. Leaf size=267

$$\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}-\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}$$

```
[Out] 1/2*(a^2+2*a*b-b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d*2^(1/2
)/e^(1/2)-1/2*(a^2+2*a*b-b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2)
)/d*2^(1/2)/e^(1/2)+1/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/
2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)/e^(1/2)-1/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+c
ot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)/e^(1/2)-2*b^2*(e*
cot(d*x+c))^(1/2)/d/e
```

Rubi [A] time = 0.25, antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {3543, 3534, 1168, 1162, 617, 204, 1165, 628}

$$\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}-\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^2/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] ((a^2 + 2*a*b - b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(S
qrt[2]*d*Sqrt[e]) - ((a^2 + 2*a*b - b^2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c +
 d*x]])/Sqrt[e]])/(Sqrt[2]*d*Sqrt[e]) - (2*b^2*Sqrt[e*Cot[c + d*x]])/(d*e)
+ ((a^2 - 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*
Cot[c + d*x]]])/(2*Sqrt[2]*d*Sqrt[e]) - ((a^2 - 2*a*b - b^2)*Log[Sqrt[e] +
Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*Sqrt[e])
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3543

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[(d^2*(a + b*Tan[e + f*x])^(m + 1))/(b*f*
(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Simp[c^2 - d^2 + 2*c*d*Tan[e + f*
x], x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c - a*d, 0] &&  !LeQ
[m, -1] &&  !(EqQ[m, 2] && EqQ[a, 0])
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^2}{\sqrt{e\cot(c+dx)}}\,dx = -\frac{2b^2\sqrt{e\cot(c+dx)}}{de}+\int \frac{a^2-b^2+2ab\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx$$

$$= -\frac{2b^2\sqrt{e\cot(c+dx)}}{de}+\frac{2\,\text{Subst}\left(\int \frac{-(a^2-b^2)e-2abx^2}{e^2+x^4}\,dx,x,\sqrt{e\cot(c+dx)}\right)}{d}$$

$$= -\frac{2b^2\sqrt{e\cot(c+dx)}}{de}-\frac{(a^2-2ab-b^2)\,\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx,x,\sqrt{e\cot(c+dx)}\right)}{d}-\frac{(a^2$$

$$= -\frac{2b^2\sqrt{e\cot(c+dx)}}{de}-\frac{(a^2+2ab-b^2)\,\text{Subst}\left(\int \frac{1}{e-\sqrt{2}\sqrt{e}x+x^2}\,dx,x,\sqrt{e\cot(c+dx)}\right)}{2d}$$

$$= -\frac{2b^2\sqrt{e\cot(c+dx)}}{de}+\frac{(a^2-2ab-b^2)\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+}\right.}{2\sqrt{2}\,d\sqrt{e}}$$

$$= \frac{(a^2+2ab-b^2)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d\sqrt{e}}-\frac{(a^2+2ab-b^2)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+d}}{\sqrt{e}}\right.}{\sqrt{2}\,d\sqrt{e}}$$

Mathematica [C] time = 0.89, size = 192, normalized size = 0.72

$$-\frac{\sqrt{\cot(c+dx)}\left(-\frac{(a^2-b^2)\left(\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+1\right)+2\tan^{-1}\left(1-\sqrt{2}\sqrt{\cot(c+dx)}\right)-2\tan^{-1}\left(\sqrt{2}\right.\right.}{2\sqrt{2}}\right.}{d\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^2/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] -((Sqrt[Cot[c + d*x]]*(2*b^2*Sqrt[Cot[c + d*x]] + (4*a*b*Cot[c + d*x]^(3/2)
*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2])/3 - ((a^2 - b^2)*(2*ArcTa
n[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]
] + Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sq
rt[Cot[c + d*x]] + Cot[c + d*x]]))/(2*Sqrt[2])))/(d*Sqrt[e*Cot[c + d*x]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^2}{\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^2/sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.52, size = 529, normalized size = 1.98

$$-\frac{2b^2\sqrt{e\cot(dx+c)}}{de}+\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \arctan\left(-\frac{\sqrt{2}\ \sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)a^2}{2ed}-\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \arctan\left(-\frac{\sqrt{2}\ \sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)b^2}{2ed}-\frac{\left(e^2\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x)
```

```
[Out] -2*b^2*(e*cot(d*x+c))^(1/2)/d/e+1/2/e/d*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)
/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2/e/d*(e^2)^(1/4)*2^(1/2)*arctan
(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/4/e/d*(e^2)^(1/4)*2^(1/
2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(
e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2+1/4
/e/d*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*
2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)
+(e^2)^(1/2)))*b^2-1/2/e/d*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)+1)*a^2+1/2/e/d*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/2/d*a*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(
d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*a*b/(e^2)^(1/4)*
2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*a*b/(e^2)^(1
/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.80, size = 242, normalized size = 0.91

$$-\frac{e\left(\frac{8\,b^{2}\sqrt{\frac{e}{\tan(dx+c)}}}{e^{2}}+\frac{\frac{2\,\sqrt{2}\left(a^{2}+2\,ab-b^{2}\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^{2}+2\,ab-b^{2}\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\left(a^{2}-2\,ab-b^{2}\right)\log\left(\cdots\right.}{}}{e}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/4*e*(8*b^2*sqrt(e/tan(d*x + c))/e^2 + (2*sqrt(2)*(a^2 + 2*a*b - b^2)*arc
tan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e)
 + 2*sqrt(2)*(a^2 + 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*s
qrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^2 - 2*a*b - b^2)*log(sqr
t(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(
a^2 - 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*
x + c))/sqrt(e))/e)/d
```

mupad [B] time = 1.01, size = 1234, normalized size = 4.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^2/(e*cot(c + d*x))^(1/2),x)
```

```
[Out] 2*atanh((32*a^4*e^2*(e*cot(c + d*x))^(1/2)*((a*b^3)/(d^2*e) - (b^4*1i)/(4*d
^2*e) - (a^4*1i)/(4*d^2*e) - (a^3*b)/(d^2*e) + (a^2*b^2*3i)/(2*d^2*e))^(1/2
))/((a^6*e^2*16i)/d - (b^6*e^2*16i)/d + (32*a*b^5*e^2)/d + (32*a^5*b*e^2)/d
 + (a^2*b^4*e^2*112i)/d - (192*a^3*b^3*e^2)/d - (a^4*b^2*e^2*112i)/d) + (32
*b^4*e^2*(e*cot(c + d*x))^(1/2)*((a*b^3)/(d^2*e) - (b^4*1i)/(4*d^2*e) - (a^
4*1i)/(4*d^2*e) - (a^3*b)/(d^2*e) + (a^2*b^2*3i)/(2*d^2*e))^(1/2))/((a^6*e^
2*16i)/d - (b^6*e^2*16i)/d + (32*a*b^5*e^2)/d + (32*a^5*b*e^2)/d + (a^2*b^4
*e^2*112i)/d - (192*a^3*b^3*e^2)/d - (a^4*b^2*e^2*112i)/d) - (192*a^2*b^2*e
^2*(e*cot(c + d*x))^(1/2)*((a*b^3)/(d^2*e) - (b^4*1i)/(4*d^2*e) - (a^4*1i)/
(4*d^2*e) - (a^3*b)/(d^2*e) + (a^2*b^2*3i)/(2*d^2*e))^(1/2))/((a^6*e^2*16i)
/d - (b^6*e^2*16i)/d + (32*a*b^5*e^2)/d + (32*a^5*b*e^2)/d + (a^2*b^4*e^2*1
12i)/d - (192*a^3*b^3*e^2)/d - (a^4*b^2*e^2*112i)/d))*((a*b^3)/(d^2*e) - (b
^4*1i)/(4*d^2*e) - (a^4*1i)/(4*d^2*e) - (a^3*b)/(d^2*e) + (a^2*b^2*3i)/(2*d
^2*e))^(1/2) + 2*atanh((32*a^4*e^2*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*
e) + (b^4*1i)/(4*d^2*e) + (a*b^3)/(d^2*e) - (a^3*b)/(d^2*e) - (a^2*b^2*3i)/
```

```
(2*d^2*e))^(1/2))/((b^6*e^2*16i)/d - (a^6*e^2*16i)/d + (32*a*b^5*e^2)/d + (
32*a^5*b*e^2)/d - (a^2*b^4*e^2*112i)/d - (192*a^3*b^3*e^2)/d + (a^4*b^2*e^2
*112i)/d) + (32*b^4*e^2*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e) + (b^4*1
i)/(4*d^2*e) + (a*b^3)/(d^2*e) - (a^3*b)/(d^2*e) - (a^2*b^2*3i)/(2*d^2*e))^
(1/2))/((b^6*e^2*16i)/d - (a^6*e^2*16i)/d + (32*a*b^5*e^2)/d + (32*a^5*b*e^
2)/d - (a^2*b^4*e^2*112i)/d - (192*a^3*b^3*e^2)/d + (a^4*b^2*e^2*112i)/d) -
 (192*a^2*b^2*e^2*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e) + (b^4*1i)/(4*
d^2*e) + (a*b^3)/(d^2*e) - (a^3*b)/(d^2*e) - (a^2*b^2*3i)/(2*d^2*e))^(1/2))
/((b^6*e^2*16i)/d - (a^6*e^2*16i)/d + (32*a*b^5*e^2)/d + (32*a^5*b*e^2)/d -
 (a^2*b^4*e^2*112i)/d - (192*a^3*b^3*e^2)/d + (a^4*b^2*e^2*112i)/d))*((a^4*
1i)/(4*d^2*e) + (b^4*1i)/(4*d^2*e) + (a*b^3)/(d^2*e) - (a^3*b)/(d^2*e) - (a
^2*b^2*3i)/(2*d^2*e))^(1/2) - (2*b^2*(e*cot(c + d*x))^(1/2))/(d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\cot(c+dx))^2}{\sqrt{e\cot(c+dx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**2/(e*cot(d*x+c))**(1/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**2/sqrt(e*cot(c + d*x)), x)
```

3.59 $\int \frac{(a+b\cot(c+dx))^2}{(e\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=267

$$\frac{(a^2+2ab-b^2)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{3/2}}-\frac{(a^2+2ab-b^2)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e}\ldots\right.}{2\sqrt{2}\,de^{3/2}}$$

```
[Out] -1/2*(a^2-2*a*b-b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(3/
2)*2^(1/2)+1/2*(a^2-2*a*b-b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2
))/d/e^(3/2)*2^(1/2)+1/4*(a^2+2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1
/2)*(e*cot(d*x+c))^(1/2))/d/e^(3/2)*2^(1/2)-1/4*(a^2+2*a*b-b^2)*ln(e^(1/2)+
cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(3/2)*2^(1/2)+2*a^2/d/
e/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.26, antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {3542, 3534, 1168, 1162, 617, 204, 1165, 628}

$$\frac{(a^2+2ab-b^2)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{3/2}}-\frac{(a^2+2ab-b^2)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e}\ldots\right.}{2\sqrt{2}\,de^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^2/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] -(((a^2 - 2*a*b - b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/
(Sqrt[2]*d*e^(3/2))) + ((a^2 - 2*a*b - b^2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[
c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(3/2)) + (2*a^2)/(d*e*Sqrt[e*Cot[c + d*x]
]) + ((a^2 + 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt
[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(3/2)) - ((a^2 + 2*a*b - b^2)*Log[Sqrt[e]
 + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(3/
2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3542

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

```
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^2}{(e\cot(c+dx))^{3/2}}\,dx = \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{\int \frac{2abe-(a^2-b^2)e\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^2}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{2\,\text{Subst}\left(\int \frac{-2abe^2+(a^2-b^2)ex^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{de^2}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{(a^2-2ab-b^2)\,\text{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{de} - \frac{(a^2+2}{}$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{(a^2+2ab-b^2)\,\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{2\sqrt{2}\,de^{3/2}} +$$

$$= \frac{2a^2}{de\sqrt{e\cot(c+dx)}} + \frac{(a^2+2ab-b^2)\log\left(\sqrt{e}+\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx}\right.}{2\sqrt{2}\,de^{3/2}}$$

$$= -\frac{(a^2-2ab-b^2)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{3/2}} + \frac{(a^2-2ab-b^2)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+}}{\sqrt{e}}\right.}{\sqrt{2}\,de^{3/2}}$$

Mathematica [C] time = 0.33, size = 218, normalized size = 0.82

$$-\frac{\cot^{\frac{3}{2}}(c+dx)\left(-\frac{2(a^2-b^2)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)}{\sqrt{\cot(c+dx)}}+4ab\left(\frac{1}{2}\left(\frac{\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+1\right)}{2\sqrt{2}}-\frac{\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)}{2\sqrt{2}}\right.\right.\right.}{d(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^2/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] -((Cot[c + d*x]^(3/2)*((-2*b^2)/Sqrt[Cot[c + d*x]] - (2*(a^2 - b^2)*Hyperge
ometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2])/Sqrt[Cot[c + d*x]] + 4*a*b*((-(A
rcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]]/Sqrt[2]) + ArcTan[1 + Sqrt[2]*Sqrt[Co
t[c + d*x]]]/Sqrt[2])/2 + (-1/2*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c
+ d*x]]/Sqrt[2] + Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]/(2*Sqr
t[2]))/2)))/(d*(e*Cot[c + d*x])^(3/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^2}{(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((b*cot(d*x + c) + a)^2/(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.46, size = 538, normalized size = 2.01

$$-\frac{ab\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{2e^{2}d}-\frac{ab\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^{2}\right)^{\frac{1}{4}}}+1\right)}{e^{2}d}+\frac{ab\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\mathrm{arct}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x)
[Out] -1/2/e^2/d*a*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)*2^(1/2)+(e^2)^(1/2)))-1/e^2/d*a*b*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/e^2/d*a*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^
(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/e/d*2^(1/2)/(e^2)^(1/4)*arcta
n(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2/e/d*2^(1/2)/(e^2)^(1/
4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/2/e/d*2^(1/2)/(
e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2/e/d*
2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2
+1/4/e/d*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(
1/2)+(e^2)^(1/2)))*a^2-1/4/e/d*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(
1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2+2*a^2/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.90, size = 242, normalized size = 0.91

$$\frac{e\left(\frac{8a^2}{e^2\sqrt{\frac{e}{\tan(dx+c)}}}+\frac{\frac{2\sqrt{2}(a^2-2ab-b^2)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}(a^2-2ab-b^2)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}(a^2+2ab-b^2)\log\left(\sqrt{2}\right.}{}}{e^2}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*e*(8*a^2/(e^2*sqrt(e/tan(d*x + c))) + (2*sqrt(2)*(a^2 - 2*a*b - b^2)*ar
ctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e
) + 2*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*
sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^2 + 2*a*b - b^2)*log(sq
rt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*
(a^2 + 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d
*x + c))/sqrt(e))/e^2)/d
```

mupad [B] time = 0.94, size = 1196, normalized size = 4.48

$$\frac{2a^2}{d\,e\,\sqrt{e\cot(c+d\,x)}}+2\,\mathrm{atanh}\left(\frac{32\,a^4\,d^3\,e^5\,\sqrt{e\cot(c+d\,x)}\,\sqrt{\frac{a^4\,1\mathrm{i}}{4\,d^2\,e^3}+\frac{b^4\,1\mathrm{i}}{4\,d^2\,e^3}-\frac{a\,b^3}{d^2\,e^3}+\frac{a^3\,b}{d^2\,e^3}-\frac{a^2}{2\,\cdots}}}{-16\,a^6\,d^2\,e^4+a^5\,b\,d^2\,e^4\,32\mathrm{i}+112\,a^4\,b^2\,d^2\,e^4-a^3\,b^3\,d^2\,e^4\,192\mathrm{i}-112\,a^2\,b^4\,d^2\,e^4+a\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^2/(e*cot(c + d*x))^(3/2),x)
```

```
[Out] 2*atanh((32*a^4*d^3*e^5*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e^3) + (b^4
*1i)/(4*d^2*e^3) - (a*b^3)/(d^2*e^3) + (a^3*b)/(d^2*e^3) - (a^2*b^2*3i)/(2*
d^2*e^3))^(1/2))/(16*b^6*d^2*e^4 - 16*a^6*d^2*e^4 + a*b^5*d^2*e^4*32i + a^5
*b*d^2*e^4*32i - 112*a^2*b^4*d^2*e^4 - a^3*b^3*d^2*e^4*192i + 112*a^4*b^2*d
^2*e^4) + (32*b^4*d^3*e^5*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e^3) + (b
^4*1i)/(4*d^2*e^3) - (a*b^3)/(d^2*e^3) + (a^3*b)/(d^2*e^3) - (a^2*b^2*3i)/(
2*d^2*e^3))^(1/2))/(16*b^6*d^2*e^4 - 16*a^6*d^2*e^4 + a*b^5*d^2*e^4*32i + a
^5*b*d^2*e^4*32i - 112*a^2*b^4*d^2*e^4 - a^3*b^3*d^2*e^4*192i + 112*a^4*b^2
*d^2*e^4) - (192*a^2*b^2*d^3*e^5*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e^
3) + (b^4*1i)/(4*d^2*e^3) - (a*b^3)/(d^2*e^3) + (a^3*b)/(d^2*e^3) - (a^2*b^
2*3i)/(2*d^2*e^3))^(1/2))/(16*b^6*d^2*e^4 - 16*a^6*d^2*e^4 + a*b^5*d^2*e^4*
32i + a^5*b*d^2*e^4*32i - 112*a^2*b^4*d^2*e^4 - a^3*b^3*d^2*e^4*192i + 112*
a^4*b^2*d^2*e^4))*(((a*b^3*4i - a^3*b*4i + a^4 + b^4 - 6*a^2*b^2)*1i)/(4*d^
```

```
2*e^3))^(1/2) - 2*atanh((32*a^4*d^3*e^5*(e*cot(c + d*x))^(1/2)*((a^3*b)/(d^
2*e^3) - (b^4*1i)/(4*d^2*e^3) - (a*b^3)/(d^2*e^3) - (a^4*1i)/(4*d^2*e^3) +
(a^2*b^2*3i)/(2*d^2*e^3))^(1/2))/(16*a^6*d^2*e^4 - 16*b^6*d^2*e^4 + a*b^5*d
^2*e^4*32i + a^5*b*d^2*e^4*32i + 112*a^2*b^4*d^2*e^4 - a^3*b^3*d^2*e^4*192i
 - 112*a^4*b^2*d^2*e^4) + (32*b^4*d^3*e^5*(e*cot(c + d*x))^(1/2)*((a^3*b)/(
d^2*e^3) - (b^4*1i)/(4*d^2*e^3) - (a*b^3)/(d^2*e^3) - (a^4*1i)/(4*d^2*e^3)
+ (a^2*b^2*3i)/(2*d^2*e^3))^(1/2))/(16*a^6*d^2*e^4 - 16*b^6*d^2*e^4 + a*b^5
*d^2*e^4*32i + a^5*b*d^2*e^4*32i + 112*a^2*b^4*d^2*e^4 - a^3*b^3*d^2*e^4*19
2i - 112*a^4*b^2*d^2*e^4) - (192*a^2*b^2*d^3*e^5*(e*cot(c + d*x))^(1/2)*((a
^3*b)/(d^2*e^3) - (b^4*1i)/(4*d^2*e^3) - (a*b^3)/(d^2*e^3) - (a^4*1i)/(4*d^
2*e^3) + (a^2*b^2*3i)/(2*d^2*e^3))^(1/2))/(16*a^6*d^2*e^4 - 16*b^6*d^2*e^4
+ a*b^5*d^2*e^4*32i + a^5*b*d^2*e^4*32i + 112*a^2*b^4*d^2*e^4 - a^3*b^3*d^2
*e^4*192i - 112*a^4*b^2*d^2*e^4))*(-((a^3*b*4i - a*b^3*4i + a^4 + b^4 - 6*a
^2*b^2)*1i)/(4*d^2*e^3))^(1/2) + (2*a^2)/(d*e*(e*cot(c + d*x))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\cot(c + dx))^2}{(e\cot(c + dx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**2/(e*cot(d*x+c))**(3/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**2/(e*cot(c + d*x))**(3/2), x)
```

3.60 $\int \frac{(a+b\cot(c+dx))^2}{(e\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=291

$$-\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{5/2}}+\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{5/2}}$$

```
[Out] 2/3*a^2/d/e/(e*cot(d*x+c))^(3/2)-1/2*(a^2+2*a*b-b^2)*arctan(1-2^(1/2)*(e*co
t(d*x+c))^(1/2)/e^(1/2))/d/e^(5/2)*2^(1/2)+1/2*(a^2+2*a*b-b^2)*arctan(1+2^(
1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(5/2)*2^(1/2)-1/4*(a^2-2*a*b-b^2)*ln
(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)
+1/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(
1/2))/d/e^(5/2)*2^(1/2)+4*a*b/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.33, antiderivative size = 291, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {3542, 3529, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{5/2}}+\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^2/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] -(((a^2 + 2*a*b - b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/
(Sqrt[2]*d*e^(5/2))) + ((a^2 + 2*a*b - b^2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[
c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(5/2)) + (2*a^2)/(3*d*e*(e*Cot[c + d*x])^
(3/2)) + (4*a*b)/(d*e^2*Sqrt[e*Cot[c + d*x]]) - ((a^2 - 2*a*b - b^2)*Log[Sq
rt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*
e^(5/2)) + ((a^2 - 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2
]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(5/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
```

```
NeQ[c^2 + d^2, 0]
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^2}{(e\cot(c+dx))^{5/2}}\,dx = \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{\int \frac{2abe-\left(a^2-b^2\right)e\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{e^2}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4ab}{de^2\sqrt{e\cot(c+dx)}} + \frac{\int \frac{-\left(a^2-b^2\right)e^2-2abe^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^4}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4ab}{de^2\sqrt{e\cot(c+dx)}} + \frac{2\,\mathrm{Subst}\left(\int \frac{\left(a^2-b^2\right)e^3+2abe^2x^2}{e^2+x^4}\,dx, x, \sqrt{e\,\mathrm{co}\ldots}\right.}{de^4}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4ab}{de^2\sqrt{e\cot(c+dx)}} + \frac{\left(a^2-2ab-b^2\right)\mathrm{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \ldots\right.}{de^2}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4ab}{de^2\sqrt{e\cot(c+dx)}} - \frac{\left(a^2-2ab-b^2\right)\mathrm{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+2x}{-e-\sqrt{2}\sqrt{e}x-x^2}\ldots\right.}{2\sqrt{2}\,de^{5/2}}$$

$$= \frac{2a^2}{3de(e\cot(c+dx))^{3/2}} + \frac{4ab}{de^2\sqrt{e\cot(c+dx)}} - \frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}+\sqrt{e}\cot(c+\ldots\right.}{2\sqrt{2}\,de^{5/2}}$$

$$= -\frac{\left(a^2+2ab-b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{5/2}} + \frac{\left(a^2+2ab-b^2\right)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c\ldots}}{\sqrt{e}}\right.}{\sqrt{2}\,de^{5/2}}$$

Mathematica [C] time = 0.30, size = 82, normalized size = 0.28

$$\frac{2\left(\left(a^2-b^2\right){}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)+b\left(6a\cot(c+dx)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)+b\right)\right)}{3de(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^2/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (2*((a^2 - b^2)*Hypergeometric2F1[-3/4, 1, 1/4, -Cot[c + d*x]^2] + b*(b + 6
*a*Cot[c + d*x]*Hypergeometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2])))/(3*d*e*
(e*Cot[c + d*x])^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^2}{(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^2/(e*cot(d*x + c))^(5/2), x)
```

maple [B] time = 0.47, size = 558, normalized size = 1.92

$$\frac{(e^2)^{\frac{1}{4}}\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{e\cot(dx+c)}}{(e^2)^{\frac{1}{4}}}+1\right)a^2}{2e^3d}-\frac{(e^2)^{\frac{1}{4}}\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{e\cot(dx+c)}}{(e^2)^{\frac{1}{4}}}+1\right)b^2}{2e^3d}-\frac{(e^2)^{\frac{1}{4}}\sqrt{2}\arctan\left(-\frac{\sqrt{2}\sqrt{e\cot(d}}{(e^2)^{\frac{1}{4}}}\right.}{2e^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x)
```

```
[Out] 1/2/e^3/d*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)+1)*a^2-1/2/e^3/d*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)*b^2-1/2/e^3/d*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2/e^3/d*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2
)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/4/e^3/d*(e^2)^(1/4)*2^(1/2)*ln(
(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(
```

```
d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2-1/4/e^3/d
*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1
/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2)))*b^2+1/2/e^2/d*a*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/e^2/d*a*b/(e^2)^(1/4)*2^(1/2)*arct
an(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/e^2/d*a*b/(e^2)^(1/4)*2^(1
/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/3*a^2/d/e/(e*cot(
d*x+c))^(3/2)+4*a*b/d/e^2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.63, size = 259, normalized size = 0.89

$$\frac{e\left(\frac{3\left(\frac{2\sqrt{2}\left(a^2+2ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^2+2ab-b^2\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}+e\right.}{\sqrt{e}}\right.}{e^3}\right.}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/12*e*(3*(2*sqrt(2)*(a^2 + 2*a*b - b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e
) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^2 + 2*a*b - b^2
)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/s
qrt(e) + sqrt(2)*(a^2 - 2*a*b - b^2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c
)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(a^2 - 2*a*b - b^2)*log(-sqrt(2)
*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/e^3 + 8*(a^2*e
 + 6*a*b*e/tan(d*x + c))/(e^3*(e/tan(d*x + c))^(3/2)))/d
```

mupad [B] time = 1.51, size = 1214, normalized size = 4.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^2/(e*cot(c + d*x))^(5/2),x)
```

```
[Out] ((2*a^2)/3 + 4*a*b*cot(c + d*x))/(d*e*(e*cot(c + d*x))^(3/2)) - 2*atanh((32
*a^4*d^3*e^8*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e^5) + (b^4*1i)/(4*d^2
```

```
*e^5) + (a*b^3)/(d^2*e^5) - (a^3*b)/(d^2*e^5) - (a^2*b^2*3i)/(2*d^2*e^5))^(
1/2))/(b^6*d^2*e^6*16i - a^6*d^2*e^6*16i + 32*a*b^5*d^2*e^6 + 32*a^5*b*d^2*
e^6 - a^2*b^4*d^2*e^6*112i - 192*a^3*b^3*d^2*e^6 + a^4*b^2*d^2*e^6*112i) +
(32*b^4*d^3*e^8*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e^5) + (b^4*1i)/(4*
d^2*e^5) + (a*b^3)/(d^2*e^5) - (a^3*b)/(d^2*e^5) - (a^2*b^2*3i)/(2*d^2*e^5)
)^(1/2))/(b^6*d^2*e^6*16i - a^6*d^2*e^6*16i + 32*a*b^5*d^2*e^6 + 32*a^5*b*d
^2*e^6 - a^2*b^4*d^2*e^6*112i - 192*a^3*b^3*d^2*e^6 + a^4*b^2*d^2*e^6*112i)
 - (192*a^2*b^2*d^3*e^8*(e*cot(c + d*x))^(1/2)*((a^4*1i)/(4*d^2*e^5) + (b^4
*1i)/(4*d^2*e^5) + (a*b^3)/(d^2*e^5) - (a^3*b)/(d^2*e^5) - (a^2*b^2*3i)/(2*
d^2*e^5))^(1/2))/(b^6*d^2*e^6*16i - a^6*d^2*e^6*16i + 32*a*b^5*d^2*e^6 + 32
*a^5*b*d^2*e^6 - a^2*b^4*d^2*e^6*112i - 192*a^3*b^3*d^2*e^6 + a^4*b^2*d^2*e
^6*112i))*(((a^3*b*4i - a*b^3*4i + a^4 + b^4 - 6*a^2*b^2)*1i)/(4*d^2*e^5))^
(1/2) - 2*atanh((32*a^4*d^3*e^8*(e*cot(c + d*x))^(1/2)*((a*b^3)/(d^2*e^5) -
 (b^4*1i)/(4*d^2*e^5) - (a^4*1i)/(4*d^2*e^5) - (a^3*b)/(d^2*e^5) + (a^2*b^2
*3i)/(2*d^2*e^5))^(1/2))/(a^6*d^2*e^6*16i - b^6*d^2*e^6*16i + 32*a*b^5*d^2*
e^6 + 32*a^5*b*d^2*e^6 + a^2*b^4*d^2*e^6*112i - 192*a^3*b^3*d^2*e^6 - a^4*b
^2*d^2*e^6*112i) + (32*b^4*d^3*e^8*(e*cot(c + d*x))^(1/2)*((a*b^3)/(d^2*e^5
) - (b^4*1i)/(4*d^2*e^5) - (a^4*1i)/(4*d^2*e^5) - (a^3*b)/(d^2*e^5) + (a^2*
b^2*3i)/(2*d^2*e^5))^(1/2))/(a^6*d^2*e^6*16i - b^6*d^2*e^6*16i + 32*a*b^5*d
^2*e^6 + 32*a^5*b*d^2*e^6 + a^2*b^4*d^2*e^6*112i - 192*a^3*b^3*d^2*e^6 - a^
4*b^2*d^2*e^6*112i) - (192*a^2*b^2*d^3*e^8*(e*cot(c + d*x))^(1/2)*((a*b^3)/
(d^2*e^5) - (b^4*1i)/(4*d^2*e^5) - (a^4*1i)/(4*d^2*e^5) - (a^3*b)/(d^2*e^5)
 + (a^2*b^2*3i)/(2*d^2*e^5))^(1/2))/(a^6*d^2*e^6*16i - b^6*d^2*e^6*16i + 32
*a*b^5*d^2*e^6 + 32*a^5*b*d^2*e^6 + a^2*b^4*d^2*e^6*112i - 192*a^3*b^3*d^2*
e^6 - a^4*b^2*d^2*e^6*112i))*(-((a*b^3*4i - a^3*b*4i + a^4 + b^4 - 6*a^2*b^
2)*1i)/(4*d^2*e^5))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \cot(c + dx))^2}{(e \cot(c + dx))^{\frac{5}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**2/(e*cot(d*x+c))**(5/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**2/(e*cot(c + d*x))**(5/2), x)
```

3.61 $\int \frac{(a+b\cot(c+dx))^2}{(e\cot(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=322

$$-\frac{\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{7/2}}+\frac{\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{\right.}}{2\sqrt{2}de^{7/2}}$$

```
[Out] 2/5*a^2/d/e/(e*cot(d*x+c))^(5/2)+4/3*a*b/d/e^2/(e*cot(d*x+c))^(3/2)+1/2*(a^
2-2*a*b-b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(7/2)*2^(1/
2)-1/2*(a^2-2*a*b-b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(
7/2)*2^(1/2)-1/4*(a^2+2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*c
ot(d*x+c))^(1/2))/d/e^(7/2)*2^(1/2)+1/4*(a^2+2*a*b-b^2)*ln(e^(1/2)+cot(d*x+
c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(7/2)*2^(1/2)-2*(a^2-b^2)/d/e^
3/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.43, antiderivative size = 322, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.360$, Rules used = {3542, 3529, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{2\left(a^2-b^2\right)}{de^3\sqrt{e\cot(c+dx)}}-\frac{\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{7/2}}+\frac{\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^2/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] ((a^2 - 2*a*b - b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(S
qrt[2]*d*e^(7/2)) - ((a^2 - 2*a*b - b^2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c +
 d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(7/2)) + (2*a^2)/(5*d*e*(e*Cot[c + d*x])^(5/
2)) + (4*a*b)/(3*d*e^2*(e*Cot[c + d*x])^(3/2)) - (2*(a^2 - b^2))/(d*e^3*Sqr
t[e*Cot[c + d*x]]) - ((a^2 + 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x
] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(7/2)) + ((a^2 + 2*a*b -
b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2
*Sqrt[2]*d*e^(7/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
```

```
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3542

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^2, x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(m +
 1))/(b*f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e +
 f*x])^(m + 1)*Simp[a*c^2 + 2*b*c*d - a*d^2 - (b*c^2 - 2*a*c*d - b*d^2)*Tan
[e + f*x], x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0]
&& LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^2}{(e\cot(c+dx))^{7/2}}\,dx = \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{\int \frac{2abe-\left(a^2-b^2\right)e\cot(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx}{e^2}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4ab}{3de^2(e\cot(c+dx))^{3/2}} + \frac{\int \frac{-\left(a^2-b^2\right)e^2-2abe^2\cot(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{e^4}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4ab}{3de^2(e\cot(c+dx))^{3/2}} - \frac{2\left(a^2-b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{\int \frac{-2abe^3+\left(a^2-b\right.}{\sqrt{e\cot}}}{e}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4ab}{3de^2(e\cot(c+dx))^{3/2}} - \frac{2\left(a^2-b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{2\,\mathrm{Subst}\left(\int \frac{2a}{}\right.}{}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4ab}{3de^2(e\cot(c+dx))^{3/2}} - \frac{2\left(a^2-b^2\right)}{de^3\sqrt{e\cot(c+dx)}} - \frac{\left(a^2-2ab-b\right.}{}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4ab}{3de^2(e\cot(c+dx))^{3/2}} - \frac{2\left(a^2-b^2\right)}{de^3\sqrt{e\cot(c+dx)}} - \frac{\left(a^2+2ab-b\right.}{}$$

$$= \frac{2a^2}{5de(e\cot(c+dx))^{5/2}} + \frac{4ab}{3de^2(e\cot(c+dx))^{3/2}} - \frac{2\left(a^2-b^2\right)}{de^3\sqrt{e\cot(c+dx)}} - \frac{\left(a^2+2ab-b\right.}{}$$

$$= \frac{\left(a^2-2ab-b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{7/2}} - \frac{\left(a^2-2ab-b^2\right)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cot(c+dx}}{\sqrt{e}}\right.}{\sqrt{2}\,de^{7/2}}$$

Mathematica [C] time = 0.36, size = 85, normalized size = 0.26

$$\frac{2\left(3\left(a^2-b^2\right){}_2F_1\left(-\frac{5}{4},1;-\frac{1}{4};-\cot^2(c+dx)\right)+b\left(10a\cot(c+dx){}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)+3b\right)\right)}{15de(e\cot(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^2/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] (2*(3*(a^2 - b^2)*Hypergeometric2F1[-5/4, 1, -1/4, -Cot[c + d*x]^2] + b*(3*
b + 10*a*Cot[c + d*x]*Hypergeometric2F1[-3/4, 1, 1/4, -Cot[c + d*x]^2])))/(
15*d*e*(e*Cot[c + d*x])^(5/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\cot\left(dx+c\right)+a\right)^2}{\left(e\cot\left(dx+c\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^2/(e*cot(d*x + c))^(7/2), x)
```

maple [B] time = 0.45, size = 600, normalized size = 1.86

$$\frac{ab\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\ \sqrt{2}+\sqrt{e^2}}\right)}{2e^4d}+\frac{ab\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \arctan\left(\frac{\sqrt{2}\ \sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{e^4d}-\frac{ab\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \text{arctan}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x)
```

```
[Out] 1/2/e^4/d*a*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2)))+1/e^4/d*a*b*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/e^4/d*a*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/e^3/d*2^(1/2)/(e^2)^(1/4)*ln((
e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d
*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2+1/4/e^3/d*
2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/
2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2
)^(1/2)))*b^2-1/2/e^3/d*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)*a^2+1/2/e^3/d*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^
(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/2/e^3/d*2^(1/2)/(e^2)^(1/4)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2/e^3/d*2^(1/2)/(e^2)^(1/4)*
arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+2/5*a^2/d/e/(e*cot(
d*x+c))^(5/2)-2/e^3/d/(e*cot(d*x+c))^(1/2)*a^2+2/e^3/d/(e*cot(d*x+c))^(1/2)
*b^2+4/3*a*b/d/e^2/(e*cot(d*x+c))^(3/2)
```

maxima [A] time = 0.53, size = 286, normalized size = 0.89

$$-\frac{e\left(\frac{15\left(\frac{2\sqrt{2}\left(a^2-2ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^2-2ab-b^2\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx+c)}}\right.}{\sqrt{e}}\right.}{e^4}\right.}{60d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^2/(e*cot(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -1/60*e*(15*(2*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt
(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^2 - 2*a*b - b
^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))
/sqrt(e) - sqrt(2)*(a^2 + 2*a*b - b^2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x +
 c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*(a^2 + 2*a*b - b^2)*log(-sqrt(
2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/e^4 - 8*(3*a
^2*e^2 + 10*a*b*e^2/tan(d*x + c) - 15*(a^2 - b^2)*e^2/tan(d*x + c)^2)/(e^4*
(e/tan(d*x + c))^(5/2)))/d
```

mupad [B] time = 2.32, size = 1227, normalized size = 3.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^2/(e*cot(c + d*x))^(7/2),x)
```

```
[Out] 2*atanh((32*a^4*d^3*e^11*(e*cot(c + d*x))^(1/2)*((a^3*b)/(d^2*e^7) - (b^4*1
i)/(4*d^2*e^7) - (a*b^3)/(d^2*e^7) - (a^4*1i)/(4*d^2*e^7) + (a^2*b^2*3i)/(2
*d^2*e^7))^(1/2))/(16*a^6*d^2*e^8 - 16*b^6*d^2*e^8 + a*b^5*d^2*e^8*32i + a^
5*b*d^2*e^8*32i + 112*a^2*b^4*d^2*e^8 - a^3*b^3*d^2*e^8*192i - 112*a^4*b^2*
d^2*e^8) + (32*b^4*d^3*e^11*(e*cot(c + d*x))^(1/2)*((a^3*b)/(d^2*e^7) - (b^
4*1i)/(4*d^2*e^7) - (a*b^3)/(d^2*e^7) - (a^4*1i)/(4*d^2*e^7) + (a^2*b^2*3i)
/(2*d^2*e^7))^(1/2))/(16*a^6*d^2*e^8 - 16*b^6*d^2*e^8 + a*b^5*d^2*e^8*32i +
 a^5*b*d^2*e^8*32i + 112*a^2*b^4*d^2*e^8 - a^3*b^3*d^2*e^8*192i - 112*a^4*b
^2*d^2*e^8) - (192*a^2*b^2*d^3*e^11*(e*cot(c + d*x))^(1/2)*((a^3*b)/(d^2*e^
7) - (b^4*1i)/(4*d^2*e^7) - (a*b^3)/(d^2*e^7) - (a^4*1i)/(4*d^2*e^7) + (a^2
*b^2*3i)/(2*d^2*e^7))^(1/2))/(16*a^6*d^2*e^8 - 16*b^6*d^2*e^8 + a*b^5*d^2*e
^8*32i + a^5*b*d^2*e^8*32i + 112*a^2*b^4*d^2*e^8 - a^3*b^3*d^2*e^8*192i - 1
12*a^4*b^2*d^2*e^8))*(-((a^3*b*4i - a*b^3*4i + a^4 + b^4 - 6*a^2*b^2)*1i)/(
4*d^2*e^7))^(1/2) - 2*atanh((32*a^4*d^3*e^11*(e*cot(c + d*x))^(1/2)*((a^4*1
i)/(4*d^2*e^7) + (b^4*1i)/(4*d^2*e^7) - (a*b^3)/(d^2*e^7) + (a^3*b)/(d^2*e^
7) - (a^2*b^2*3i)/(2*d^2*e^7))^(1/2))/(16*b^6*d^2*e^8 - 16*a^6*d^2*e^8 + a*
b^5*d^2*e^8*32i + a^5*b*d^2*e^8*32i - 112*a^2*b^4*d^2*e^8 - a^3*b^3*d^2*e^8
*192i + 112*a^4*b^2*d^2*e^8) + (32*b^4*d^3*e^11*(e*cot(c + d*x))^(1/2)*((a^
4*1i)/(4*d^2*e^7) + (b^4*1i)/(4*d^2*e^7) - (a*b^3)/(d^2*e^7) + (a^3*b)/(d^2
*e^7) - (a^2*b^2*3i)/(2*d^2*e^7))^(1/2))/(16*b^6*d^2*e^8 - 16*a^6*d^2*e^8 +
 a*b^5*d^2*e^8*32i + a^5*b*d^2*e^8*32i - 112*a^2*b^4*d^2*e^8 - a^3*b^3*d^2*
e^8*192i + 112*a^4*b^2*d^2*e^8) - (192*a^2*b^2*d^3*e^11*(e*cot(c + d*x))^(1
/2)*((a^4*1i)/(4*d^2*e^7) + (b^4*1i)/(4*d^2*e^7) - (a*b^3)/(d^2*e^7) + (a^3
*b)/(d^2*e^7) - (a^2*b^2*3i)/(2*d^2*e^7))^(1/2))/(16*b^6*d^2*e^8 - 16*a^6*d
^2*e^8 + a*b^5*d^2*e^8*32i + a^5*b*d^2*e^8*32i - 112*a^2*b^4*d^2*e^8 - a^3*
b^3*d^2*e^8*192i + 112*a^4*b^2*d^2*e^8))*(((a*b^3*4i - a^3*b*4i + a^4 + b^4
 - 6*a^2*b^2)*1i)/(4*d^2*e^7))^(1/2) + ((2*a^2)/5 - 2*cot(c + d*x)^2*(a^2 -
 b^2) + (4*a*b*cot(c + d*x))/3)/(d*e*(e*cot(c + d*x))^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\cot(c + dx))^2}{(e\cot(c + dx))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**2/(e*cot(d*x+c))**(7/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**2/(e*cot(c + d*x))**(7/2), x)
```

3.62 $\int (e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^3\,dx$

Optimal. Leaf size=372

$$-\frac{e^{3/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d}+\frac{e^{3/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{}\right.}{}$$

```
[Out] -2/3*b*(3*a^2-b^2)*(e*cot(d*x+c))^(3/2)/d-32/35*a*b^2*(e*cot(d*x+c))^(5/2)/
d/e-2/7*b^2*(e*cot(d*x+c))^(5/2)*(a+b*cot(d*x+c))/d/e-1/2*(a-b)*(a^2+4*a*b+
b^2)*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d*2^(1/2)+1/2*(
a-b)*(a^2+4*a*b+b^2)*e^(3/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))
/d*2^(1/2)-1/4*(a+b)*(a^2-4*a*b+b^2)*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-
2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)+1/4*(a+b)*(a^2-4*a*b+b^2)*e^(3/2)*l
n(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)-2*a*(a
^2-3*b^2)*e*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.56, antiderivative size = 372, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {3566, 3630, 3528, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{e^{3/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d}+\frac{e^{3/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(((a - b)*(a^2 + 4*a*b + b^2)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d
*x]])/Sqrt[e]])/(Sqrt[2]*d)) + ((a - b)*(a^2 + 4*a*b + b^2)*e^(3/2)*ArcTan[
1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d) - (2*a*(a^2 - 3*b^
2)*e*Sqrt[e*Cot[c + d*x]])/d - (2*b*(3*a^2 - b^2)*(e*Cot[c + d*x])^(3/2))/(
3*d) - (32*a*b^2*(e*Cot[c + d*x])^(5/2))/(35*d*e) - (2*b^2*(e*Cot[c + d*x])
^(5/2)*(a + b*Cot[c + d*x]))/(7*d*e) - ((a + b)*(a^2 - 4*a*b + b^2)*e^(3/2)
*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqr
t[2]*d) + ((a + b)*(a^2 - 4*a*b + b^2)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c
+ d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d)
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3528

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

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
```

```
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int (e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^3\,dx = -\frac{2b^2(e\cot(c+dx))^{5/2}(a+b\cot(c+dx))}{7de} - \frac{2\int (e\cot(c+dx))^{3/2}\left(-\frac{1}{2}\right.}{}$$

$$= -\frac{32ab^2(e\cot(c+dx))^{5/2}}{35de} - \frac{2b^2(e\cot(c+dx))^{5/2}(a+b\cot(c+dx))}{7de} -$$

$$= -\frac{2b\left(3a^2-b^2\right)(e\cot(c+dx))^{3/2}}{3d} - \frac{32ab^2(e\cot(c+dx))^{5/2}}{35de} - \frac{2b^2(e\,\mathrm{cc}}{}$$

$$= -\frac{2a\left(a^2-3b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{2b\left(3a^2-b^2\right)(e\cot(c+dx))^{3/2}}{3d} - \frac{3}{}$$

$$= -\frac{2a\left(a^2-3b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{2b\left(3a^2-b^2\right)(e\cot(c+dx))^{3/2}}{3d} - \frac{3}{}$$

$$= -\frac{2a\left(a^2-3b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{2b\left(3a^2-b^2\right)(e\cot(c+dx))^{3/2}}{3d} - \frac{3}{}$$

$$= -\frac{2a\left(a^2-3b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{2b\left(3a^2-b^2\right)(e\cot(c+dx))^{3/2}}{3d} - \frac{3}{}$$

$$= -\frac{2a\left(a^2-3b^2\right)e\sqrt{e\cot(c+dx)}}{d} - \frac{2b\left(3a^2-b^2\right)(e\cot(c+dx))^{3/2}}{3d} - \frac{3}{}$$

$$= -\frac{(a-b)\left(a^2+4ab+b^2\right)e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d} + \frac{(a-b)\left(a^2\right.}{}$$

Mathematica [C] time = 3.06, size = 251, normalized size = 0.67

$$-\frac{(e\cot(c+dx))^{3/2}\left(\frac{2}{3}b\left(b^2-3a^2\right)\cot^{\frac{3}{2}}(c+dx)\left({}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-1\right)+\frac{1}{4}a\left(a^2-3b^2\right)\left(8\sqrt{\cot(c+dx)}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(((e*Cot[c + d*x])^(3/2)*((6*a*b^2*Cot[c + d*x]^(5/2))/5 + (2*b^3*Cot[c +
d*x]^(7/2))/7 + (2*b*(-3*a^2 + b^2)*Cot[c + d*x]^(3/2)*(-1 + Hypergeometric
2F1[3/4, 1, 7/4, -Cot[c + d*x]^2]))/3 + (a*(a^2 - 3*b^2)*(2*Sqrt[2]*ArcTan[
```

```
1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c +
 d*x]]] + 8*Sqrt[Cot[c + d*x]] + Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]
 + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x
]]])/4))/(d*Cot[c + d*x]^(3/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)^3 (e\cot(dx+c))^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^3*(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.75, size = 807, normalized size = 2.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^3,x)
```

```
[Out] -2/7/d/e^2*(e*cot(d*x+c))^(7/2)*b^3-6/5*a*b^2*(e*cot(d*x+c))^(5/2)/d/e-2/d*
a^2*b*(e*cot(d*x+c))^(3/2)+2/3/d*(e*cot(d*x+c))^(3/2)*b^3-2*a^3*e*(e*cot(d*
x+c))^(1/2)/d+6/d*e*a*b^2*(e*cot(d*x+c))^(1/2)+1/4/d*e*(e^2)^(1/4)*2^(1/2)*
ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*c
ot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^3-3/4/d*
e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(
1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e
^2)^(1/2)))*a*b^2-1/2/d*e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+1/2/d*e*(e^2)^(1/4)*2^(1/2)*arctan(2^
(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3-3/2/d*e*(e^2)^(1/4)*2^(1/2)*a
rctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+3/4/d*e^2*2^(1/2)/(
e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^
(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))
```

```
*a^2*b-1/4/d*e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)*2^(1/2)+(e^2)^(1/2)))*b^3-3/2/d*e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2
)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d*e^2*2^(1/2)/(e^2)^(1/4)*a
rctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+3/2/d*e^2*2^(1/2)/(e
^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d*e^
2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^
3
```

<u>maxima</u> [A] time = 0.44, size = 347, normalized size = 0.93

$$\left(105\left(\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\left(a^3-3\right.}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)*(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/420*(105*(2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)*(s
qrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3
+ 3*a^2*b - 3*a*b^2 - b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/
tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*l
og(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqr
t(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x +
c)) + e + e/tan(d*x + c))/sqrt(e))*e - 8*(63*a*b^2*e*(e/tan(d*x + c))^(5/2)
 + 15*b^3*(e/tan(d*x + c))^(7/2) + 105*(a^3 - 3*a*b^2)*e^3*sqrt(e/tan(d*x +
 c)) + 35*(3*a^2*b - b^3)*e^2*(e/tan(d*x + c))^(3/2))/e^3)*e/d
```

<u>mupad</u> [B] time = 5.47, size = 2317, normalized size = 6.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)*(a + b*cot(c + d*x))^3,x)
```

```
[Out] (e*cot(c + d*x))^(3/2)*((2*b^3)/(3*d) - (2*a^2*b)/d) - (e*cot(c + d*x))^(1/
2)*((2*a^3*e)/d - (6*a*b^2*e)/d) - atan((((16*(e*cot(c + d*x))^(1/2)*(a^6*e
^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4*b^2*e^6))/d^2 - (8*(4*a^3*d^2*e^5 -
12*a*b^2*d^2*e^5)*(-(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 -
a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/2))/d^3)*(-
(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 - a^2*b^4*e^3*15i - 20
```

```
*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/2)*1i + ((16*(e*cot(c + d*x))^(
1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4*b^2*e^6))/d^2 + (8*(4*a^3
*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a
^5*b*e^3 - a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/
2))/d^3)*(-(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 - a^2*b^4*e
^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/2)*1i)/(((16*(e*cot(
c + d*x))^(1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4*b^2*e^6))/d^2
+ (8*(4*a^3*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^
5*e^3 + 6*a^5*b*e^3 - a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(
4*d^2))^(1/2))/d^3)*(-(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3
- a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/2) - ((16
*(e*cot(c + d*x))^(1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4*b^2*e^
6))/d^2 - (8*(4*a^3*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(b^6*e^3*1i - a^6*e^3*1i
+ 6*a*b^5*e^3 + 6*a^5*b*e^3 - a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^
3*15i)/(4*d^2))^(1/2))/d^3)*(-(b^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a^
5*b*e^3 - a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/2
) + (16*(3*a^8*b*e^8 - b^9*e^8 + 6*a^4*b^5*e^8 + 8*a^6*b^3*e^8))/d^3))*(-(b
^6*e^3*1i - a^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 - a^2*b^4*e^3*15i - 20*a
^3*b^3*e^3 + a^4*b^2*e^3*15i)/(4*d^2))^(1/2)*2i - atan((((16*(e*cot(c + d*x
))^(1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4*b^2*e^6))/d^2 - (8*(4
*a^3*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(a^6*e^3*1i - b^6*e^3*1i + 6*a*b^5*e^3 +
 6*a^5*b*e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15i)/(4*d^2))
^(1/2))/d^3)*(-(a^6*e^3*1i - b^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 + a^2*b
^4*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15i)/(4*d^2))^(1/2)*1i + ((16*(e*
cot(c + d*x))^(1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4*b^2*e^6))/
d^2 + (8*(4*a^3*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(a^6*e^3*1i - b^6*e^3*1i + 6*
a*b^5*e^3 + 6*a^5*b*e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15
i)/(4*d^2))^(1/2))/d^3)*(-(a^6*e^3*1i - b^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*
e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15i)/(4*d^2))^(1/2)*1i
)/(((16*(e*cot(c + d*x))^(1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6 - 15*a^4
*b^2*e^6))/d^2 + (8*(4*a^3*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(a^6*e^3*1i - b^6*
e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 - a^4
*b^2*e^3*15i)/(4*d^2))^(1/2))/d^3)*(-(a^6*e^3*1i - b^6*e^3*1i + 6*a*b^5*e^3
 + 6*a^5*b*e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15i)/(4*d^2
))^(1/2) - ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^6 - b^6*e^6 + 15*a^2*b^4*e^6
- 15*a^4*b^2*e^6))/d^2 - (8*(4*a^3*d^2*e^5 - 12*a*b^2*d^2*e^5)*(-(a^6*e^3*1
i - b^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e
^3 - a^4*b^2*e^3*15i)/(4*d^2))^(1/2))/d^3)*(-(a^6*e^3*1i - b^6*e^3*1i + 6*a
*b^5*e^3 + 6*a^5*b*e^3 + a^2*b^4*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15i
)/(4*d^2))^(1/2) + (16*(3*a^8*b*e^8 - b^9*e^8 + 6*a^4*b^5*e^8 + 8*a^6*b^3*e
^8))/d^3))*(-(a^6*e^3*1i - b^6*e^3*1i + 6*a*b^5*e^3 + 6*a^5*b*e^3 + a^2*b^4
*e^3*15i - 20*a^3*b^3*e^3 - a^4*b^2*e^3*15i)/(4*d^2))^(1/2)*2i - (2*b^3*(e*
cot(c + d*x))^(7/2))/(7*d*e^2) - (6*a*b^2*(e*cot(c + d*x))^(5/2))/(5*d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \cot (c+dx))^{\frac{3}{2}} (a+b \cot (c+dx))^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)*(a+b*cot(d*x+c))**3,x)
[Out] Integral((e*cot(c + d*x))**(3/2)*(a + b*cot(c + d*x))**3, x)
```

3.63 $\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^3\,dx$

Optimal. Leaf size=342

$$-\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d}-\frac{\sqrt{e}\,(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{\sqrt{e}}{}$$

```
[Out] -8/5*a*b^2*(e*cot(d*x+c))^(3/2)/d/e-2/5*b^2*(e*cot(d*x+c))^(3/2)*(a+b*cot(d
*x+c))/d/e+1/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/
e^(1/2))*e^(1/2)/d*2^(1/2)-1/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1+2^(1/2)*(e*co
t(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/d*2^(1/2)-1/4*(a-b)*(a^2+4*a*b+b^2)*ln(e^(
1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)+1/4
*(a-b)*(a^2+4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))
^(1/2))*e^(1/2)/d*2^(1/2)-2*b*(3*a^2-b^2)*(e*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.48, antiderivative size = 342, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {3566, 3630, 3528, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d}-\frac{\sqrt{e}\,(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d}+\frac{\sqrt{e}}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^3,x]
```

```
[Out] ((a + b)*(a^2 - 4*a*b + b^2)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x
]])/Sqrt[e]])/(Sqrt[2]*d) - ((a + b)*(a^2 - 4*a*b + b^2)*Sqrt[e]*ArcTan[1 +
 (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d) - (2*b*(3*a^2 - b^2)*
Sqrt[e*Cot[c + d*x]])/d - (8*a*b^2*(e*Cot[c + d*x])^(3/2))/(5*d*e) - (2*b^2
*(e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x]))/(5*d*e) - ((a - b)*(a^2 + 4*a
*b + b^2)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c
 + d*x]]])/(2*Sqrt[2]*d) + ((a - b)*(a^2 + 4*a*b + b^2)*Sqrt[e]*Log[Sqrt[e]
 + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d)
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3528

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

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
```

```
 NeQ[c^2 + d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^3\,dx = -\frac{2b^2(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))}{5de} - \frac{2\int \sqrt{e\cot(c+dx)}\left(-\frac{1}{2}a\left(5\right.\right.}{}$$

$$= -\frac{8ab^2(e\cot(c+dx))^{3/2}}{5de} - \frac{2b^2(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))}{5de} - \frac{2}{}$$

$$= -\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d} - \frac{8ab^2(e\cot(c+dx))^{3/2}}{5de} - \frac{2b^2(e\cot(c}{}$$

$$= -\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d} - \frac{8ab^2(e\cot(c+dx))^{3/2}}{5de} - \frac{2b^2(e\cot(c}{}$$

$$= -\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d} - \frac{8ab^2(e\cot(c+dx))^{3/2}}{5de} - \frac{2b^2(e\cot(c}{}$$

$$= -\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d} - \frac{8ab^2(e\cot(c+dx))^{3/2}}{5de} - \frac{2b^2(e\cot(c}{}$$

$$= -\frac{2b\left(3a^2-b^2\right)\sqrt{e\cot(c+dx)}}{d} - \frac{8ab^2(e\cot(c+dx))^{3/2}}{5de} - \frac{2b^2(e\cot(c}{}$$

$$= \frac{(a+b)\left(a^2-4ab+b^2\right)\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d} - \frac{(a+b)\left(a^2-4\right.}{}$$

Mathematica [C] time = 2.59, size = 247, normalized size = 0.72

$$-\frac{\sqrt{e\cot(c+dx)}\left(\frac{2}{3}a\left(a^2-3b^2\right)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-\frac{1}{4}b\left(b^2-3a^2\right)\left(8\sqrt{\cot(c+dx)}+\sqrt{2}\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -((Sqrt[e*Cot[c + d*x]]*(2*a*b^2*Cot[c + d*x]^(3/2) + (2*b^3*Cot[c + d*x]^(
5/2))/5 + (2*a*(a^2 - 3*b^2)*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7
/4, -Cot[c + d*x]^2])/3 - (b*(-3*a^2 + b^2)*(2*Sqrt[2]*ArcTan[1 - Sqrt[2]*S
qrt[Cot[c + d*x]]] - 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 8*S
qrt[Cot[c + d*x]] + Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*
x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/4))/(d*S
qrt[Cot[c + d*x]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^3,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)^3\sqrt{e\cot(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^3,x, algorithm="giac")
[Out] integrate((b*cot(d*x + c) + a)^3*sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.72, size = 750, normalized size = 2.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^3,x)
[Out] -2/5/d/e^2*b^3*(e*cot(d*x+c))^(5/2)-2*a*b^2*(e*cot(d*x+c))^(3/2)/d/e-6/d*(e
*cot(d*x+c))^(1/2)*a^2*b+2/d*b^3*(e*cot(d*x+c))^(1/2)+3/4/d*(e^2)^(1/4)*2^(
1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b
-1/4/d*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/
2)+(e^2)^(1/2)))*b^3-3/2/d*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+3/2/d*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d*(e^2)^(1/4)*2^(1/2)*arct
an(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3-1/4/d*e*2^(1/2)/(e^2)^(1
/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/
(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^3+3/
4/d*e*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2
)+(e^2)^(1/2)))*a*b^2+1/2/d*e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)*a^3-3/2/d*e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2-1/2/d*e*2^(1/2)/(e^2)^(1/4)*arcta
```

```
n(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e*2^(1/2)/(e^2)^(1/
4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2
```

maxima [A] time = 0.44, size = 316, normalized size = 0.92

$$-\frac{\left(\frac{10\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{10\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{5\sqrt{2}\left(a^3+3\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)*(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/20*(10*sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*arctan(1/2*sqrt(2)*(sqrt(
2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 10*sqrt(2)*(a^3 - 3
*a^2*b - 3*a*b^2 + b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan
(d*x + c)))/sqrt(e))/sqrt(e) - 5*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*lo
g(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + 5*sq
rt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x +
 c)) + e + e/tan(d*x + c))/sqrt(e) + 8*(5*a*b^2*e*(e/tan(d*x + c))^(3/2) +
b^3*(e/tan(d*x + c))^(5/2) + 5*(3*a^2*b - b^3)*e^2*sqrt(e/tan(d*x + c)))/e^
3)*e/d
```

mupad [B] time = 2.55, size = 2071, normalized size = 6.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)*(a + b*cot(c + d*x))^3,x)
```

```
[Out] (e*cot(c + d*x))^(1/2)*((2*b^3)/d - (6*a^2*b)/d) + atan((((16*(e*cot(c + d*
x))^(1/2)*(a^6*e^4 - b^6*e^4 + 15*a^2*b^4*e^4 - 15*a^4*b^2*e^4))/d^2 - (8*(
4*b^3*d^2*e^4 - 12*a^2*b*d^2*e^4)*((b^6*e*1i - a^6*e*1i - a^2*b^4*e*15i - 2
0*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2))/d^3)*(
(b^6*e*1i - a^6*e*1i - a^2*b^4*e*15i - 20*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b
^5*e + 6*a^5*b*e)/(4*d^2))^(1/2)*1i + ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^4
- b^6*e^4 + 15*a^2*b^4*e^4 - 15*a^4*b^2*e^4))/d^2 + (8*(4*b^3*d^2*e^4 - 12*
a^2*b*d^2*e^4)*((b^6*e*1i - a^6*e*1i - a^2*b^4*e*15i - 20*a^3*b^3*e + a^4*b
^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2))/d^3)*((b^6*e*1i - a^6*e*1
i - a^2*b^4*e*15i - 20*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(
4*d^2))^(1/2)*1i)/(((16*(e*cot(c + d*x))^(1/2)*(a^6*e^4 - b^6*e^4 + 15*a^2*
b^4*e^4 - 15*a^4*b^2*e^4))/d^2 - (8*(4*b^3*d^2*e^4 - 12*a^2*b*d^2*e^4)*((b^
```

```
6*e*1i - a^6*e*1i - a^2*b^4*e*15i - 20*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b^5*
e + 6*a^5*b*e)/(4*d^2))^(1/2))/d^3)*((b^6*e*1i - a^6*e*1i - a^2*b^4*e*15i -
 20*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2) - ((1
6*(e*cot(c + d*x))^(1/2)*(a^6*e^4 - b^6*e^4 + 15*a^2*b^4*e^4 - 15*a^4*b^2*e
^4))/d^2 + (8*(4*b^3*d^2*e^4 - 12*a^2*b*d^2*e^4)*((b^6*e*1i - a^6*e*1i - a^
2*b^4*e*15i - 20*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2)
)^(1/2))/d^3)*((b^6*e*1i - a^6*e*1i - a^2*b^4*e*15i - 20*a^3*b^3*e + a^4*b^
2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2) + (16*(3*a*b^8*e^5 - a^9*e^
5 + 8*a^3*b^6*e^5 + 6*a^5*b^4*e^5))/d^3))*((b^6*e*1i - a^6*e*1i - a^2*b^4*e
*15i - 20*a^3*b^3*e + a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2)
*2i + atan((((16*(e*cot(c + d*x))^(1/2)*(a^6*e^4 - b^6*e^4 + 15*a^2*b^4*e^4
 - 15*a^4*b^2*e^4))/d^2 - (8*(4*b^3*d^2*e^4 - 12*a^2*b*d^2*e^4)*((a^6*e*1i
- b^6*e*1i + a^2*b^4*e*15i - 20*a^3*b^3*e - a^4*b^2*e*15i + 6*a*b^5*e + 6*a
^5*b*e)/(4*d^2))^(1/2))/d^3)*((a^6*e*1i - b^6*e*1i + a^2*b^4*e*15i - 20*a^3
*b^3*e - a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2)*1i + ((16*(e
*cot(c + d*x))^(1/2)*(a^6*e^4 - b^6*e^4 + 15*a^2*b^4*e^4 - 15*a^4*b^2*e^4))
/d^2 + (8*(4*b^3*d^2*e^4 - 12*a^2*b*d^2*e^4)*((a^6*e*1i - b^6*e*1i + a^2*b^
4*e*15i - 20*a^3*b^3*e - a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1
/2))/d^3)*((a^6*e*1i - b^6*e*1i + a^2*b^4*e*15i - 20*a^3*b^3*e - a^4*b^2*e*
15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2)*1i)/(((16*(e*cot(c + d*x))^(1/2
)*(a^6*e^4 - b^6*e^4 + 15*a^2*b^4*e^4 - 15*a^4*b^2*e^4))/d^2 - (8*(4*b^3*d^
2*e^4 - 12*a^2*b*d^2*e^4)*((a^6*e*1i - b^6*e*1i + a^2*b^4*e*15i - 20*a^3*b^
3*e - a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2))/d^3)*((a^6*e*1
i - b^6*e*1i + a^2*b^4*e*15i - 20*a^3*b^3*e - a^4*b^2*e*15i + 6*a*b^5*e + 6
*a^5*b*e)/(4*d^2))^(1/2) - ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^4 - b^6*e^4 +
 15*a^2*b^4*e^4 - 15*a^4*b^2*e^4))/d^2 + (8*(4*b^3*d^2*e^4 - 12*a^2*b*d^2*e
^4)*((a^6*e*1i - b^6*e*1i + a^2*b^4*e*15i - 20*a^3*b^3*e - a^4*b^2*e*15i +
6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/2))/d^3)*((a^6*e*1i - b^6*e*1i + a^2*b^4
*e*15i - 20*a^3*b^3*e - a^4*b^2*e*15i + 6*a*b^5*e + 6*a^5*b*e)/(4*d^2))^(1/
2) + (16*(3*a*b^8*e^5 - a^9*e^5 + 8*a^3*b^6*e^5 + 6*a^5*b^4*e^5))/d^3))*((a
^6*e*1i - b^6*e*1i + a^2*b^4*e*15i - 20*a^3*b^3*e - a^4*b^2*e*15i + 6*a*b^5
*e + 6*a^5*b*e)/(4*d^2))^(1/2)*2i - (2*b^3*(e*cot(c + d*x))^(5/2))/(5*d*e^2
) - (2*a*b^2*(e*cot(c + d*x))^(3/2))/(d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)*(a+b*cot(d*x+c))**3,x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))*(a + b*cot(c + d*x))**3, x)
```

3.64 $\int \frac{(a+b\cot(c+dx))^3}{\sqrt{e\cot(c+dx)}}\,dx$

Optimal. Leaf size=313

$$\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\,\cot(c+\right.}{2\sqrt{2}\,d\sqrt{e}}$$

```
[Out] 1/2*(a-b)*(a^2+4*a*b+b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d*
2^(1/2)/e^(1/2)-1/2*(a-b)*(a^2+4*a*b+b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(
1/2)/e^(1/2))/d*2^(1/2)/e^(1/2)+1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+cot(d*
x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2^(1/2)/e^(1/2)-1/4*(a+b)*(a^2
-4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d*2
^(1/2)/e^(1/2)-16/3*a*b^2*(e*cot(d*x+c))^(1/2)/d/e-2/3*b^2*(a+b*cot(d*x+c))
*(e*cot(d*x+c))^(1/2)/d/e
```

Rubi [A] time = 0.43, antiderivative size = 313, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {3566, 3630, 3534, 1168, 1162, 617, 204, 1165, 628}

$$\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}}-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\,\cot(c+\right.}{2\sqrt{2}\,d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^3/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] ((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt
[e]])/(Sqrt[2]*d*Sqrt[e]) - ((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 + (Sqrt[2
]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*Sqrt[e]) - (16*a*b^2*Sqrt[e*Co
t[c + d*x]])/(3*d*e) - (2*b^2*Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x]))/(3
*d*e) + ((a + b)*(a^2 - 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - S
qrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*Sqrt[e]) - ((a + b)*(a^2 - 4*a*b
 + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])
/(2*Sqrt[2]*d*Sqrt[e])
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
```

```
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^3}{\sqrt{e\cot(c+dx)}}\,dx = -\frac{2b^2\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}{3de} - \frac{2\int \frac{-\frac{1}{2}a\left(3a^2-b^2\right)e-\frac{3}{2}b\left(3a^2-b^2\right)e\cot(c+dx)-4ab^2e\cot^2(\ldots}{\sqrt{e\cot(c+dx)}}}{3e}$$

$$= -\frac{16ab^2\sqrt{e\cot(c+dx)}}{3de} - \frac{2b^2\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}{3de} - \frac{2\int \frac{-\frac{3}{2}a\left(a^2-3b^2\right)e-\frac{3}{2}b(\ldots}{\sqrt{e\cot(\ldots}}}{3e\ldots}$$

$$= -\frac{16ab^2\sqrt{e\cot(c+dx)}}{3de} - \frac{2b^2\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}{3de} - \frac{4\,\mathrm{Subst}\left(\int \frac{\frac{3}{2}a\left(a^2-3b\ldots}{\ldots}\right.}{\ldots}$$

$$= -\frac{16ab^2\sqrt{e\cot(c+dx)}}{3de} - \frac{2b^2\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}{3de} - \frac{\left((a+b)\left(a^2-4ab\ldots\right.\right.}{\ldots}$$

$$= -\frac{16ab^2\sqrt{e\cot(c+dx)}}{3de} - \frac{2b^2\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}{3de} - \frac{\left((a-b)\left(a^2+4ab\ldots\right.\right.}{\ldots}$$

$$= -\frac{16ab^2\sqrt{e\cot(c+dx)}}{3de} - \frac{2b^2\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}{3de} + \frac{(a+b)\left(a^2-4ab+\ldots\right.}{\ldots}$$

$$= \frac{(a-b)\left(a^2+4ab+b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,d\sqrt{e}} - \frac{(a-b)\left(a^2+4ab+b^2\right)\tan^{-1}\left(1\ldots\right.}{\sqrt{2}\,d\sqrt{e}}$$

Mathematica [C] time = 1.03, size = 216, normalized size = 0.69

$$-\frac{2\sqrt{\cot(c+dx)}\left(-b\left(b^2-3a^2\right)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-\frac{3a\left(a^2-3b^2\right)\left(\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-\right.}{}\right.}{3d\sqrt{e\,\mathrm{co}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^3/Sqrt[e*Cot[c + d*x]],x]
```

```
[Out] (-2*Sqrt[Cot[c + d*x]]*(9*a*b^2*Sqrt[Cot[c + d*x]] + b^3*Cot[c + d*x]^(3/2)
 - b*(-3*a^2 + b^2)*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[
c + d*x]^2] - (3*a*(a^2 - 3*b^2)*(2*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]]
- 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + Log[1 - Sqrt[2]*Sqrt[Cot[c + d
*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))
/(4*Sqrt[2])))/(3*d*Sqrt[e*Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^3}{\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^3/sqrt(e*cot(d*x + c)), x)
```

maple [B] time = 0.61, size = 725, normalized size = 2.32

$$-\frac{2b^3\left(e\cot(dx+c)\right)^{\frac{3}{2}}}{3d\,e^2}-\frac{6a\,b^2\sqrt{e\cot(dx+c)}}{de}+\frac{a^3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \arctan\left(-\frac{\sqrt{2}\ \sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)}{2de}-\frac{3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\ \arctan\left(-\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x)
```

```
[Out] -2/3/d/e^2*b^3*(e*cot(d*x+c))^(3/2)-6*a*b^2*(e*cot(d*x+c))^(1/2)/d/e+1/2/d*
a^3/e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)-3/2/d/e*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)*a*b^2-1/2/d*a^3/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)+1)+3/2/d/e*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)+1)*a*b^2-1/4/d*a^3/e*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d
*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+3/4/d/e*(e^2)^(1/4)*2
^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b
^2+3/2/d*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)+1)*a^2*b-1/2/d*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)*b^3-3/4/d*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b+1/4/d*2^(1/2)/(e^2)^(1/4)*ln((e*co
t(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c
)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3-3/2/d*2^(1/2)/
(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d*
2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3
```

maxima [A] time = 0.52, size = 292, normalized size = 0.93

$$-\frac{e\left(\frac{3\left(\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\log\left(\cdots\right.}{e}\cdots\right.}{12d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/12*e*(3*(2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)*(s
qrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3
+ 3*a^2*b - 3*a*b^2 - b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/
tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*l
og(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqr
t(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x +
```

```
c)) + e + e/tan(d*x + c))/sqrt(e))/e + 8*(9*a*b^2*e*sqrt(e/tan(d*x + c)) +
b^3*(e/tan(d*x + c))^(3/2))/e^3)/d
```

mupad [B] time = 1.41, size = 1896, normalized size = 6.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^3/(e*cot(c + d*x))^(1/2),x)
```

```
[Out] atan((((16*(e*cot(c + d*x))^(1/2)*(a^6*e^2 - b^6*e^2 + 15*a^2*b^4*e^2 - 15*
a^4*b^2*e^2))/d^2 - (8*(4*a^3*d^2*e^3 - 12*a*b^2*d^2*e^3)*(((a*b^5*6i + a^5
*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e))^(
1/2))/d^3)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i +
15*a^4*b^2)*1i)/(4*d^2*e))^(1/2)*1i + ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^2
- b^6*e^2 + 15*a^2*b^4*e^2 - 15*a^4*b^2*e^2))/d^2 + (8*(4*a^3*d^2*e^3 - 12*
a*b^2*d^2*e^3)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20
i + 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2))/d^3)*(((a*b^5*6i + a^5*b*6i - a^6 + b
^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2)*1i)/(((16*
(e*cot(c + d*x))^(1/2)*(a^6*e^2 - b^6*e^2 + 15*a^2*b^4*e^2 - 15*a^4*b^2*e^2
))/d^2 + (8*(4*a^3*d^2*e^3 - 12*a*b^2*d^2*e^3)*(((a*b^5*6i + a^5*b*6i - a^6
 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2))/d^3)*
(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)
*1i)/(4*d^2*e))^(1/2) - ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^2 - b^6*e^2 + 15
*a^2*b^4*e^2 - 15*a^4*b^2*e^2))/d^2 - (8*(4*a^3*d^2*e^3 - 12*a*b^2*d^2*e^3)
*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2
)*1i)/(4*d^2*e))^(1/2))/d^3)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^
4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2) + (16*(3*a^8*b*e^2 - b^9
*e^2 + 6*a^4*b^5*e^2 + 8*a^6*b^3*e^2))/d^3))*(((a*b^5*6i + a^5*b*6i - a^6 +
 b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2)*2i + ata
n((((16*(e*cot(c + d*x))^(1/2)*(a^6*e^2 - b^6*e^2 + 15*a^2*b^4*e^2 - 15*a^4
*b^2*e^2))/d^2 - (8*(4*a^3*d^2*e^3 - 12*a*b^2*d^2*e^3)*(((a*b^5*6i + a^5*b*
6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2
))/d^3)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*
a^4*b^2)*1i)/(4*d^2*e))^(1/2)*1i + ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^2 - b
^6*e^2 + 15*a^2*b^4*e^2 - 15*a^4*b^2*e^2))/d^2 + (8*(4*a^3*d^2*e^3 - 12*a*b
^2*d^2*e^3)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i -
 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2))/d^3)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6
+ 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2)*1i)/(((16*(e*
cot(c + d*x))^(1/2)*(a^6*e^2 - b^6*e^2 + 15*a^2*b^4*e^2 - 15*a^4*b^2*e^2))/
d^2 + (8*(4*a^3*d^2*e^3 - 12*a*b^2*d^2*e^3)*(((a*b^5*6i + a^5*b*6i + a^6 -
b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2))/d^3)*(((
a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i
)/(4*d^2*e))^(1/2) - ((16*(e*cot(c + d*x))^(1/2)*(a^6*e^2 - b^6*e^2 + 15*a^
2*b^4*e^2 - 15*a^4*b^2*e^2))/d^2 - (8*(4*a^3*d^2*e^3 - 12*a*b^2*d^2*e^3)*((
```

```
(a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1
i)/(4*d^2*e))^(1/2))/d^3)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 -
 a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2) + (16*(3*a^8*b*e^2 - b^9*e^
2 + 6*a^4*b^5*e^2 + 8*a^6*b^3*e^2))/d^3))*(((a*b^5*6i + a^5*b*6i + a^6 - b^
6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e))^(1/2)*2i - (2*b^3
*(e*cot(c + d*x))^(3/2))/(3*d*e^2) - (6*a*b^2*(e*cot(c + d*x))^(1/2))/(d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\cot(c + dx))^3}{\sqrt{e\cot(c + dx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**3/(e*cot(d*x+c))**(1/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**3/sqrt(e*cot(c + d*x)), x)
```

3.65 $\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=313

$$\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}}-\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+\right.}{2\sqrt{2}de^{3}}$$

```
[Out] -1/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d
/e^(3/2)*2^(1/2)+1/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^
(1/2)/e^(1/2))/d/e^(3/2)*2^(1/2)+1/4*(a-b)*(a^2+4*a*b+b^2)*ln(e^(1/2)+cot(d
*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(3/2)*2^(1/2)-1/4*(a-b)*(a^
2+4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/
e^(3/2)*2^(1/2)+2*a^2*(a+b*cot(d*x+c))/d/e/(e*cot(d*x+c))^(1/2)-2*b*(a^2+b^
2)*(e*cot(d*x+c))^(1/2)/d/e^2
```

Rubi [A] time = 0.42, antiderivative size = 313, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {3565, 3630, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{2b\left(a^2+b^2\right)\sqrt{e\cot(c+dx)}}{de^2}+\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}}-\frac{(a-b)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] -(((a + b)*(a^2 - 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sq
rt[e]])/(Sqrt[2]*d*e^(3/2))) + ((a + b)*(a^2 - 4*a*b + b^2)*ArcTan[1 + (Sqr
t[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(3/2)) - (2*b*(a^2 + b^2)
*Sqrt[e*Cot[c + d*x]])/(d*e^2) + (2*a^2*(a + b*Cot[c + d*x]))/(d*e*Sqrt[e*C
ot[c + d*x]]) + ((a - b)*(a^2 + 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c +
d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(3/2)) - ((a - b)*(a^2
 + 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c +
 d*x]]])/(2*Sqrt[2]*d*e^(3/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
```

```
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3630

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a +
 b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)), x] + Int[(a + b*Tan[e + f*x])^m*Si
mp[A - C + B*Tan[e + f*x], x], x] /; FreeQ[{a, b, e, f, A, B, C, m}, x] &&
NeQ[A*b^2 - a*b*B + a^2*C, 0] &&  !LeQ[m, -1]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{3/2}}\,dx = \frac{2a^2(a+b\cot(c+dx))}{de\sqrt{e\cot(c+dx)}} - \frac{2\int \frac{-2a^2be^2+\frac{1}{2}a\left(a^2-3b^2\right)e^2\cot(c+dx)-\frac{1}{2}b\left(a^2+b^2\right)e^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{e^3}$$

$$= -\frac{2b\left(a^2+b^2\right)\sqrt{e\cot(c+dx)}}{de^2} + \frac{2a^2(a+b\cot(c+dx))}{de\sqrt{e\cot(c+dx)}} - \frac{2\int \frac{-\frac{1}{2}b\left(3a^2-b^2\right)e^2+\frac{1}{2}a\left(a^2-3b^2\right)}{\sqrt{e\cot(c+dx)}}}{e^3}$$

$$= -\frac{2b\left(a^2+b^2\right)\sqrt{e\cot(c+dx)}}{de^2} + \frac{2a^2(a+b\cot(c+dx))}{de\sqrt{e\cot(c+dx)}} - \frac{4\,\mathrm{Subst}\left(\int \frac{\frac{1}{2}b\left(3a^2-b^2\right)e^3-\frac{1}{2}a}{e^2+x^4}\right.}{}$$

$$= -\frac{2b\left(a^2+b^2\right)\sqrt{e\cot(c+dx)}}{de^2} + \frac{2a^2(a+b\cot(c+dx))}{de\sqrt{e\cot(c+dx)}} + \frac{\left((a+b)\left(a^2-4ab+b^2\right)\right)}{}$$

$$= -\frac{2b\left(a^2+b^2\right)\sqrt{e\cot(c+dx)}}{de^2} + \frac{2a^2(a+b\cot(c+dx))}{de\sqrt{e\cot(c+dx)}} + \frac{\left((a-b)\left(a^2+4ab+b^2\right)\right)}{}$$

$$= -\frac{2b\left(a^2+b^2\right)\sqrt{e\cot(c+dx)}}{de^2} + \frac{2a^2(a+b\cot(c+dx))}{de\sqrt{e\cot(c+dx)}} + \frac{(a-b)\left(a^2+4ab+b^2\right)\mathrm{lo}}{}$$

$$= -\frac{(a+b)\left(a^2-4ab+b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{3/2}} + \frac{(a+b)\left(a^2-4ab+b^2\right)\tan^{-1}}{\sqrt{2}\,de^{3/2}}$$

Mathematica [C] time = 3.39, size = 193, normalized size = 0.62

$$\frac{2\left(a\left(a^2-3b^2\right)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)-\frac{b\left(b^2-3a^2\right)\sqrt{\cot(c+dx)}\left(\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+\right.\right.}{4\sqrt{2}}}{de\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(3/2),x]
```

```
[Out] (2*(3*a*b^2 - b^3*Cot[c + d*x] + a*(a^2 - 3*b^2)*Hypergeometric2F1[-1/4, 1,
 3/4, -Cot[c + d*x]^2] - (b*(-3*a^2 + b^2)*Sqrt[Cot[c + d*x]]*(2*ArcTan[1 -
 Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + L
og[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Co
t[c + d*x]] + Cot[c + d*x]]))/(4*Sqrt[2])))/(d*e*Sqrt[e*Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(3/2), x)
```

maple [B] time = 0.47, size = 742, normalized size = 2.37

$$-\frac{2b^3\sqrt{e\cot(dx+c)}}{d\,e^2}+\frac{3\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)a^2b}{2d\,e^2}-\frac{\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(-\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}+1\right)b^3}{2d\,e^2}-\frac{3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x)
```

```
[Out] -2/d/e^2*b^3*(e*cot(d*x+c))^(1/2)+3/2/d/e^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d/e^2*(e^2)^(1/4)*2^(1/2
)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3-3/4/d/e^2*(e^2)^(
1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2
)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
))*a^2*b+1/4/d/e^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))
^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3-3/2/d/e^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d/e^2*(e^2)^(1/4)*2^(1/2)*
arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+1/4/d*a^3/e*2^(1/2)/
(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)
^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
)-3/4/d/e*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^
(1/2)+(e^2)^(1/2)))*a*b^2-1/2/d*a^3/e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+3/2/d/e*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1
/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+1/2/d*a^3/e*2^(1/2)/(e^2)^(1/
4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-3/2/d/e*2^(1/2)/(e^2)
^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+2/d*a^3/e/(
e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.65, size = 290, normalized size = 0.93

$$\frac{e\left(\frac{8a^3}{e^2\sqrt{\frac{e}{\tan(dx+c)}}}-\frac{8b^3\sqrt{\frac{e}{\tan(dx+c)}}}{e^3}+\frac{\frac{2\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\tan(\cdots}\right.}{2\sqrt{e}}\right.}{\sqrt{e}}\cdots}{\cdots}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/4*e*(8*a^3/(e^2*sqrt(e/tan(d*x + c))) - 8*b^3*sqrt(e/tan(d*x + c))/e^3 +
(2*sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt
(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 - 3*a^2*b -
 3*a*b^2 + b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c
)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*log(sqrt(2)*
sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*(a^3 +
 3*a^2*b - 3*a*b^2 - b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e
/tan(d*x + c))/sqrt(e))/e^2)/d
```

mupad [B] time = 1.20, size = 1951, normalized size = 6.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^3/(e*cot(c + d*x))^(3/2),x)
```

```
[Out] (2*a^3)/(d*e*(e*cot(c + d*x))^(1/2)) - atan((((e*cot(c + d*x))^(1/2)*(16*a^
6*d^3*e^5 - 16*b^6*d^3*e^5 + 240*a^2*b^4*d^3*e^5 - 240*a^4*b^2*d^3*e^5) + (
32*b^3*d^4*e^7 - 96*a^2*b*d^4*e^7)*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15
*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2))*(-((a*b^5*6i +
 a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e
^3))^(1/2)*1i + ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^5 - 16*b^6*d^3*e^5 +
240*a^2*b^4*d^3*e^5 - 240*a^4*b^2*d^3*e^5) - (32*b^3*d^4*e^7 - 96*a^2*b*d^4
*e^7)*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a
^4*b^2)*1i)/(4*d^2*e^3))^(1/2))*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^
2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2)*1i)/(((e*cot(c + d
*x))^(1/2)*(16*a^6*d^3*e^5 - 16*b^6*d^3*e^5 + 240*a^2*b^4*d^3*e^5 - 240*a^4
*b^2*d^3*e^5) - (32*b^3*d^4*e^7 - 96*a^2*b*d^4*e^7)*(-((a*b^5*6i + a^5*b*6i
 + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2
))*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*
b^2)*1i)/(4*d^2*e^3))^(1/2) - ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^5 - 16*
b^6*d^3*e^5 + 240*a^2*b^4*d^3*e^5 - 240*a^4*b^2*d^3*e^5) + (32*b^3*d^4*e^7
- 96*a^2*b*d^4*e^7)*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*
b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2))*(-((a*b^5*6i + a^5*b*6i + a^6
 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2) - 16
*a^9*d^2*e^4 + 48*a*b^8*d^2*e^4 + 128*a^3*b^6*d^2*e^4 + 96*a^5*b^4*d^2*e^4)
)*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b
^2)*1i)/(4*d^2*e^3))^(1/2)*2i - atan((((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e
^5 - 16*b^6*d^3*e^5 + 240*a^2*b^4*d^3*e^5 - 240*a^4*b^2*d^3*e^5) + (32*b^3*
d^4*e^7 - 96*a^2*b*d^4*e^7)*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^
4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2))*(-((a*b^5*6i + a^5*b*
6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1
/2)*1i + ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^5 - 16*b^6*d^3*e^5 + 240*a^2
*b^4*d^3*e^5 - 240*a^4*b^2*d^3*e^5) - (32*b^3*d^4*e^7 - 96*a^2*b*d^4*e^7)*(
-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)
*1i)/(4*d^2*e^3))^(1/2))*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 -
 a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2)*1i)/(((e*cot(c + d*x))^(1
/2)*(16*a^6*d^3*e^5 - 16*b^6*d^3*e^5 + 240*a^2*b^4*d^3*e^5 - 240*a^4*b^2*d^
3*e^5) - (32*b^3*d^4*e^7 - 96*a^2*b*d^4*e^7)*(-((a*b^5*6i + a^5*b*6i - a^6
+ b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2))*(-((
a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i
)/(4*d^2*e^3))^(1/2) - ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^5 - 16*b^6*d^3
*e^5 + 240*a^2*b^4*d^3*e^5 - 240*a^4*b^2*d^3*e^5) + (32*b^3*d^4*e^7 - 96*a^
```

```
2*b*d^4*e^7)*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i
 + 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2))*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6
- 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^3))^(1/2) - 16*a^9*d^
2*e^4 + 48*a*b^8*d^2*e^4 + 128*a^3*b^6*d^2*e^4 + 96*a^5*b^4*d^2*e^4))*(-((a
*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)
/(4*d^2*e^3))^(1/2)*2i - (2*b^3*(e*cot(c + d*x))^(1/2))/(d*e^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\cot(c + dx))^3}{(e\cot(c + dx))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**3/(e*cot(d*x+c))**(3/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**3/(e*cot(c + d*x))**(3/2), x)
```

3.66 $\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=313

$$-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{5/2}}+\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+\right.}{2\sqrt{2}de^{5}}$$

```
[Out] 2/3*a^2*(a+b*cot(d*x+c))/d/e/(e*cot(d*x+c))^(3/2)-1/2*(a-b)*(a^2+4*a*b+b^2)
*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(5/2)*2^(1/2)+1/2*(a-b)
*(a^2+4*a*b+b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(5/2)*2
^(1/2)-1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*c
ot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)+1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+co
t(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(5/2)*2^(1/2)+16/3*a^2*b
/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.46, antiderivative size = 313, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {3565, 3628, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{5/2}}+\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+\right.}{2\sqrt{2}de^{5}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] -(((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sq
rt[e]])/(Sqrt[2]*d*e^(5/2))) + ((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 + (Sqr
t[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(5/2)) + (16*a^2*b)/(3*d*
e^2*Sqrt[e*Cot[c + d*x]]) + (2*a^2*(a + b*Cot[c + d*x]))/(3*d*e*(e*Cot[c +
d*x])^(3/2)) - ((a + b)*(a^2 - 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d
*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(5/2)) + ((a + b)*(a^2
- 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c +
d*x]]])/(2*Sqrt[2]*d*e^(5/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
```

```
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3628

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*tan[(e_.) +
 (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2
- a*b*B + a^2*C)*(a + b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)*(a^2 + b^2)), x
] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])^(m + 1)*Simp[b*B + a*(A -
C) - (A*b - a*B - b*C)*Tan[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B,
 C}, x] && NeQ[A*b^2 - a*b*B + a^2*C, 0] && LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{5/2}}\,dx = \frac{2a^2(a+b\cot(c+dx))}{3de(e\cot(c+dx))^{3/2}} - \frac{2\int \frac{-4a^2be^2+\frac{3}{2}a\left(a^2-3b^2\right)e^2\cot(c+dx)+\frac{1}{2}b\left(a^2-3b^2\right)e^2\cot^2(c+dx)}{(e\cot(c+dx))^{3/2}}\,dx}{3e^3}$$

$$= \frac{16a^2b}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{3de(e\cot(c+dx))^{3/2}} - \frac{2\int \frac{\frac{3}{2}a\left(a^2-3b^2\right)e^3+\frac{3}{2}b\left(3a^2-b^2\right)e^3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{3e^5}$$

$$= \frac{16a^2b}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{3de(e\cot(c+dx))^{3/2}} - \frac{4\,\mathrm{Subst}\left(\int \frac{-\frac{3}{2}a\left(a^2-3b^2\right)e^4-\frac{3}{2}b\left(3a^2-b^2\right)e^3x^2}{e^2+x^4}\right.}{3de^5}$$

$$= \frac{16a^2b}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{3de(e\cot(c+dx))^{3/2}} + \frac{\left((a+b)\left(a^2-4ab+b^2\right)\right)\mathrm{Subst}\left(\int \frac{e}{e^2}\right.}{de^2}$$

$$= \frac{16a^2b}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{3de(e\cot(c+dx))^{3/2}} - \frac{\left((a+b)\left(a^2-4ab+b^2\right)\right)\mathrm{Subst}\left(\int -\right.}{2\sqrt{2}\,d}$$

$$= \frac{16a^2b}{3de^2\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{3de(e\cot(c+dx))^{3/2}} - \frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}+\sqrt{\right.}}{2\sqrt{2}\,d}$$

$$= -\frac{(a-b)\left(a^2+4ab+b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{5/2}} + \frac{(a-b)\left(a^2+4ab+b^2\right)\tan^{-1}\left(1\right.}{\sqrt{2}\,de^{5/2}}$$

Mathematica [C] time = 0.38, size = 104, normalized size = 0.33

$$\frac{-6b\left(b^2-3a^2\right)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)+2a\left(a^2-3b^2\right)\tan(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)+6b^2(a\,\text{ta}}{3de^2\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(5/2),x]
```

```
[Out] (-6*b*(-3*a^2 + b^2)*Hypergeometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] + 2*a
*(a^2 - 3*b^2)*Hypergeometric2F1[-3/4, 1, 1/4, -Cot[c + d*x]^2]*Tan[c + d*x
] + 6*b^2*(b + a*Tan[c + d*x]))/(3*d*e^2*Sqrt[e*Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(5/2), x)
```

maple [B] time = 0.46, size = 743, normalized size = 2.37

$$\frac{(e^2)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)a^3}{4d\,e^3}-\frac{3(e^2)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-(e^2)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)a\,b^2}{4d\,e^3}+\frac{a^3\,(e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x)
```

[Out] 1/4/d/e^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^
(1/2)+(e^2)^(1/2)))*a^3-3/4/d/e^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)
*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2+1/2/d*a^3/e^3*(e^2)^(1/4)
*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-3/2/d/e^3*(e^2)
^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2-1/2
/d/e^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
+1)*a^3+3/2/d/e^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)*a*b^2+3/4/d/e^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(
1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b-1/4/d/e^2*2^(1/2)/(e^2)^(1/4
)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e
*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3+3/2/
d/e^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1
)*a^2*b-1/2/d/e^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x
+c))^(1/2)+1)*b^3-3/2/d/e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)
*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d/e^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2
)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+2/3/d/e*a^3/(e*cot(d*x+c))^(3/2)+
6*a^2*b/d/e^2/(e*cot(d*x+c))^(1/2)

maxima [A] time = 0.69, size = 289, normalized size = 0.92

$$\frac{e\left(\frac{3\left(\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\log\left(\sqrt{\cdots}\right.}{\cdots}}{e^3}\cdots\right)}{12d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(5/2),x, algorithm="maxima")

[Out] 1/12*e*(3*(2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)*(sq
rt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 +
3*a^2*b - 3*a*b^2 - b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/t
an(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*lo
g(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt
(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c

```
)) + e + e/tan(d*x + c))/sqrt(e))/e^3 + 8*(a^3*e + 9*a^2*b*e/tan(d*x + c))/
(e^3*(e/tan(d*x + c))^(3/2)))/d
```

mupad [B] time = 1.67, size = 1946, normalized size = 6.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^3/(e*cot(c + d*x))^(5/2),x)
```

```
[Out] ((2*a^3*e)/3 + 6*a^2*b*e*cot(c + d*x))/(d*e^2*(e*cot(c + d*x))^(3/2)) - ata
n((((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^8 - 16*b^6*d^3*e^8 + 240*a^2*b^4*d
^3*e^8 - 240*a^4*b^2*d^3*e^8) + (32*a^3*d^4*e^11 - 96*a*b^2*d^4*e^11)*(((a*
b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/
(4*d^2*e^5))^(1/2))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b
^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2)*1i + ((e*cot(c + d*x))^(1/2)*(1
6*a^6*d^3*e^8 - 16*b^6*d^3*e^8 + 240*a^2*b^4*d^3*e^8 - 240*a^4*b^2*d^3*e^8)
 - (32*a^3*d^4*e^11 - 96*a*b^2*d^4*e^11)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6
 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2))*(((a*b^5*
6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d
^2*e^5))^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^8 - 16*b^6*d^3*e^
8 + 240*a^2*b^4*d^3*e^8 - 240*a^4*b^2*d^3*e^8) + (32*a^3*d^4*e^11 - 96*a*b^
2*d^4*e^11)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i -
 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 1
5*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2) - ((e*cot(c +
d*x))^(1/2)*(16*a^6*d^3*e^8 - 16*b^6*d^3*e^8 + 240*a^2*b^4*d^3*e^8 - 240*a^
4*b^2*d^3*e^8) - (32*a^3*d^4*e^11 - 96*a*b^2*d^4*e^11)*(((a*b^5*6i + a^5*b*
6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1
/2))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4
*b^2)*1i)/(4*d^2*e^5))^(1/2) - 16*b^9*d^2*e^6 + 48*a^8*b*d^2*e^6 + 96*a^4*b
^5*d^2*e^6 + 128*a^6*b^3*d^2*e^6))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*
a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2)*2i - atan((((e*c
ot(c + d*x))^(1/2)*(16*a^6*d^3*e^8 - 16*b^6*d^3*e^8 + 240*a^2*b^4*d^3*e^8 -
 240*a^4*b^2*d^3*e^8) + (32*a^3*d^4*e^11 - 96*a*b^2*d^4*e^11)*(((a*b^5*6i +
 a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e
^5))^(1/2))*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i +
 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2)*1i + ((e*cot(c + d*x))^(1/2)*(16*a^6*d^
3*e^8 - 16*b^6*d^3*e^8 + 240*a^2*b^4*d^3*e^8 - 240*a^4*b^2*d^3*e^8) - (32*a
^3*d^4*e^11 - 96*a*b^2*d^4*e^11)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^
2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2))*(((a*b^5*6i + a^5
*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^5))
^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^8 - 16*b^6*d^3*e^8 + 240*
a^2*b^4*d^3*e^8 - 240*a^4*b^2*d^3*e^8) + (32*a^3*d^4*e^11 - 96*a*b^2*d^4*e^
11)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*
b^2)*1i)/(4*d^2*e^5))^(1/2))*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^
```

```
4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2) - ((e*cot(c + d*x))^(1
/2)*(16*a^6*d^3*e^8 - 16*b^6*d^3*e^8 + 240*a^2*b^4*d^3*e^8 - 240*a^4*b^2*d^
3*e^8) - (32*a^3*d^4*e^11 - 96*a*b^2*d^4*e^11)*(((a*b^5*6i + a^5*b*6i - a^6
 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2))*(((
a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i
)/(4*d^2*e^5))^(1/2) - 16*b^9*d^2*e^6 + 48*a^8*b*d^2*e^6 + 96*a^4*b^5*d^2*e
^6 + 128*a^6*b^3*d^2*e^6))*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4
- a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^5))^(1/2)*2i
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\cot(c + dx))^3}{(e\cot(c + dx))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**3/(e*cot(d*x+c))**(5/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**3/(e*cot(c + d*x))**(5/2), x)
```

3.67 $\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=343

$$-\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{7/2}}+\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c\right.}{2\sqrt{2}\,d}$$

```
[Out] 8/5*a^2*b/d/e^2/(e*cot(d*x+c))^(3/2)+2/5*a^2*(a+b*cot(d*x+c))/d/e/(e*cot(d*
x+c))^(5/2)+1/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)
/e^(1/2))/d/e^(7/2)*2^(1/2)-1/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1+2^(1/2)*(e*c
ot(d*x+c))^(1/2)/e^(1/2))/d/e^(7/2)*2^(1/2)-1/4*(a-b)*(a^2+4*a*b+b^2)*ln(e^
(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(7/2)*2^(1/2)+1/
4*(a-b)*(a^2+4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c)
)^(1/2))/d/e^(7/2)*2^(1/2)-2*a*(a^2-3*b^2)/d/e^3/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.56, antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {3565, 3628, 3529, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{2a\left(a^2-3b^2\right)}{de^3\sqrt{e\cot(c+dx)}}-\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{7/2}}+\frac{(a-b)\left(a^2+4ab\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] ((a + b)*(a^2 - 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt
[e]])/(Sqrt[2]*d*e^(7/2)) - ((a + b)*(a^2 - 4*a*b + b^2)*ArcTan[1 + (Sqrt[2
]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(7/2)) + (8*a^2*b)/(5*d*e^2*
(e*Cot[c + d*x])^(3/2)) - (2*a*(a^2 - 3*b^2))/(d*e^3*Sqrt[e*Cot[c + d*x]])
+ (2*a^2*(a + b*Cot[c + d*x]))/(5*d*e*(e*Cot[c + d*x])^(5/2)) - ((a - b)*(a
^2 + 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c
 + d*x]]])/(2*Sqrt[2]*d*e^(7/2)) + ((a - b)*(a^2 + 4*a*b + b^2)*Log[Sqrt[e]
 + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(7/
2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
```

```
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3628

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*tan[(e_.) +
 (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2
- a*b*B + a^2*C)*(a + b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)*(a^2 + b^2)), x
] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])^(m + 1)*Simp[b*B + a*(A -
C) - (A*b - a*B - b*C)*Tan[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B,
 C}, x] && NeQ[A*b^2 - a*b*B + a^2*C, 0] && LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{7/2}}\,dx = \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{2\int \frac{-6a^2be^2+\frac{5}{2}a\left(a^2-3b^2\right)e^2\cot(c+dx)+\frac{1}{2}b\left(3a^2-5b^2\right)e^2\cot^2(c+dx)}{(e\cot(c+dx))^{5/2}}\,dx}{5e^3}$$

$$= \frac{8a^2b}{5de^2(e\cot(c+dx))^{3/2}} + \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{2\int \frac{\frac{5}{2}a\left(a^2-3b^2\right)e^3+\frac{5}{2}b\left(3a^2-b^2\right)e^3\cot(c+dx)}{(e\cot(c+dx))^{3/2}}}{5e^5}$$

$$= \frac{8a^2b}{5de^2(e\cot(c+dx))^{3/2}} - \frac{2a\left(a^2-3b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{2\int \frac{\frac{5}{2}b\left(3a^2-b^2\right)\cdots}{\cdots}}{\cdots}$$

$$= \frac{8a^2b}{5de^2(e\cot(c+dx))^{3/2}} - \frac{2a\left(a^2-3b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{4\,\mathrm{Subst}\left(\int \cdots\right)}{\cdots}$$

$$= \frac{8a^2b}{5de^2(e\cot(c+dx))^{3/2}} - \frac{2a\left(a^2-3b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{\left((a+b)\left(a^2-\cdots\right.\right.}{\cdots}$$

$$= \frac{8a^2b}{5de^2(e\cot(c+dx))^{3/2}} - \frac{2a\left(a^2-3b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{\left((a-b)\left(a^2+\cdots\right.\right.}{\cdots}$$

$$= \frac{8a^2b}{5de^2(e\cot(c+dx))^{3/2}} - \frac{2a\left(a^2-3b^2\right)}{de^3\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\cot(c+dx))}{5de(e\cot(c+dx))^{5/2}} - \frac{(a-b)\left(a^2+\cdots\right.}{\cdots}$$

$$= \frac{(a+b)\left(a^2-4ab+b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{7/2}} - \frac{(a+b)\left(a^2-4ab+b^2\right)\tan^{-1}\left(1-\cdots\right.}{\sqrt{2}\,de^{7/2}}$$

Mathematica [C] time = 0.61, size = 108, normalized size = 0.31

$$\frac{2\left(3a\left(a^2-3b^2\right){}_2F_1\left(-\frac{5}{4},1;-\frac{1}{4};-\cot^2(c+dx)\right)+b\left(5\left(3a^2-b^2\right)\cot(c+dx)\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)+b(9a\cdots\right.\right.}{15de(e\cot(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(7/2),x]
```

```
[Out] (2*(3*a*(a^2 - 3*b^2)*Hypergeometric2F1[-5/4, 1, -1/4, -Cot[c + d*x]^2] + b
*(b*(9*a + 5*b*Cot[c + d*x]) + 5*(3*a^2 - b^2)*Cot[c + d*x]*Hypergeometric2
F1[-3/4, 1, 1/4, -Cot[c + d*x]^2])))/(15*d*e*(e*Cot[c + d*x])^(5/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(7/2), x)
```

maple [B] time = 0.46, size = 786, normalized size = 2.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x)
```

```
[Out] -3/2/d/e^4*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)*a^2*b+1/2/d/e^4*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)+1)*b^3+3/4/d/e^4*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b-1/4/d/e^4*(e^2)^(1/4)*2^
(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
)/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3+
3/2/d/e^4*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/
2)+1)*a^2*b-1/2/d/e^4*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)+1)*b^3-1/4/d*a^3/e^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+3/4/d/e^3*2^(1/2)/(e^2)^(1/4)
*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*
cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2+1/2
/d*a^3/e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)-3/2/d/e^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)*a*b^2-1/2/d*a^3/e^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)+1)+3/2/d/e^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)
/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+2/5/d*a^3/e/(e*cot(d*x+c))^(5/2)
+2*a^2*b/d/e^2/(e*cot(d*x+c))^(3/2)-2*a^3/d/e^3/(e*cot(d*x+c))^(1/2)+6/d/e^
3*a/(e*cot(d*x+c))^(1/2)*b^2
```

maxima [A] time = 0.71, size = 316, normalized size = 0.92

$$-\frac{e\left(\frac{5\left(\frac{2\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\log(}{}\right.}{e^4}\right.}{20d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -1/20*e*(5*(2*sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*arctan(1/2*sqrt(2)*(s
qrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3
- 3*a^2*b - 3*a*b^2 + b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/
tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*l
og(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqr
t(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x +
c)) + e + e/tan(d*x + c))/sqrt(e))/e^4 - 8*(a^3*e^2 + 5*a^2*b*e^2/tan(d*x +
 c) - 5*(a^3 - 3*a*b^2)*e^2/tan(d*x + c)^2)/(e^4*(e/tan(d*x + c))^(5/2)))/d
```

mupad [B] time = 3.06, size = 1969, normalized size = 5.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^3/(e*cot(c + d*x))^(7/2),x)
```

```
[Out] atan((((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^11 - 16*b^6*d^3*e^11 + 240*a^2*
b^4*d^3*e^11 - 240*a^4*b^2*d^3*e^11) + (32*b^3*d^4*e^15 - 96*a^2*b*d^4*e^15
)*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b
^2)*1i)/(4*d^2*e^7))^(1/2))*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^
4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2)*1i + ((e*cot(c + d*x))
^(1/2)*(16*a^6*d^3*e^11 - 16*b^6*d^3*e^11 + 240*a^2*b^4*d^3*e^11 - 240*a^4*
b^2*d^3*e^11) - (32*b^3*d^4*e^15 - 96*a^2*b*d^4*e^15)*(-((a*b^5*6i + a^5*b*
6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1
/2))*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^
4*b^2)*1i)/(4*d^2*e^7))^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^11
```

```
 - 16*b^6*d^3*e^11 + 240*a^2*b^4*d^3*e^11 - 240*a^4*b^2*d^3*e^11) - (32*b^3
*d^4*e^15 - 96*a^2*b*d^4*e^15)*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2
*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2))*(-((a*b^5*6i + a^5
*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^7))
^(1/2) - ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^11 - 16*b^6*d^3*e^11 + 240*a
^2*b^4*d^3*e^11 - 240*a^4*b^2*d^3*e^11) + (32*b^3*d^4*e^15 - 96*a^2*b*d^4*e
^15)*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^
4*b^2)*1i)/(4*d^2*e^7))^(1/2))*(-((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2
*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2) - 16*a^9*d^2*e^8 +
48*a*b^8*d^2*e^8 + 128*a^3*b^6*d^2*e^8 + 96*a^5*b^4*d^2*e^8))*(-((a*b^5*6i
+ a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*
e^7))^(1/2)*2i + atan((((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^11 - 16*b^6*d^
3*e^11 + 240*a^2*b^4*d^3*e^11 - 240*a^4*b^2*d^3*e^11) + (32*b^3*d^4*e^15 -
96*a^2*b*d^4*e^15)*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b
^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2))*(-((a*b^5*6i + a^5*b*6i + a^6
- b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2)*1i +
((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^11 - 16*b^6*d^3*e^11 + 240*a^2*b^4*d^
3*e^11 - 240*a^4*b^2*d^3*e^11) - (32*b^3*d^4*e^15 - 96*a^2*b*d^4*e^15)*(-((
a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i
)/(4*d^2*e^7))^(1/2))*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^
3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)
*(16*a^6*d^3*e^11 - 16*b^6*d^3*e^11 + 240*a^2*b^4*d^3*e^11 - 240*a^4*b^2*d^
3*e^11) - (32*b^3*d^4*e^15 - 96*a^2*b*d^4*e^15)*(-((a*b^5*6i + a^5*b*6i + a
^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2))*(
-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)
*1i)/(4*d^2*e^7))^(1/2) - ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^11 - 16*b^6
*d^3*e^11 + 240*a^2*b^4*d^3*e^11 - 240*a^4*b^2*d^3*e^11) + (32*b^3*d^4*e^15
 - 96*a^2*b*d^4*e^15)*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^
3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2))*(-((a*b^5*6i + a^5*b*6i + a
^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^7))^(1/2) -
16*a^9*d^2*e^8 + 48*a*b^8*d^2*e^8 + 128*a^3*b^6*d^2*e^8 + 96*a^5*b^4*d^2*e^
8))*(-((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4
*b^2)*1i)/(4*d^2*e^7))^(1/2)*2i + ((2*a^3*e)/5 + 2*e*cot(c + d*x)^2*(3*a*b^
2 - a^3) + 2*a^2*b*e*cot(c + d*x))/(d*e^2*(e*cot(c + d*x))^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**3/(e*cot(d*x+c))**(7/2),x)
```

```
[Out] Integral((a + b*cot(c + d*x))**3/(e*cot(c + d*x))**(7/2), x)
```

3.68 $\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=377

$$\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{9/2}}-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+\right.}{2\sqrt{2}\,de^{9/2}}$$

```
[Out] 32/35*a^2*b/d/e^2/(e*cot(d*x+c))^(5/2)-2/3*a*(a^2-3*b^2)/d/e^3/(e*cot(d*x+c
))^(3/2)+2/7*a^2*(a+b*cot(d*x+c))/d/e/(e*cot(d*x+c))^(7/2)+1/2*(a-b)*(a^2+4
*a*b+b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/e^(9/2)*2^(1/2)-
1/2*(a-b)*(a^2+4*a*b+b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/d/
e^(9/2)*2^(1/2)+1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(
1/2)*(e*cot(d*x+c))^(1/2))/d/e^(9/2)*2^(1/2)-1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e
^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/d/e^(9/2)*2^(1/2)-2
*b*(3*a^2-b^2)/d/e^4/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.66, antiderivative size = 377, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {3565, 3628, 3529, 3534, 1168, 1162, 617, 204, 1165, 628}

$$-\frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}}-\frac{2b\left(3a^2-b^2\right)}{de^4\sqrt{e\cot(c+dx)}}+\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\right.}{2\sqrt{2}\,de^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(9/2),x]
```

```
[Out] ((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt
[e]])/(Sqrt[2]*d*e^(9/2)) - ((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 + (Sqrt[2
]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*d*e^(9/2)) + (32*a^2*b)/(35*d*e^
2*(e*Cot[c + d*x])^(5/2)) - (2*a*(a^2 - 3*b^2))/(3*d*e^3*(e*Cot[c + d*x])^(
3/2)) - (2*b*(3*a^2 - b^2))/(d*e^4*Sqrt[e*Cot[c + d*x]]) + (2*a^2*(a + b*Co
t[c + d*x]))/(7*d*e*(e*Cot[c + d*x])^(7/2)) + ((a + b)*(a^2 - 4*a*b + b^2)*
Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt
[2]*d*e^(9/2)) - ((a + b)*(a^2 - 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c +
 d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*d*e^(9/2))
```

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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3628

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((A_.) + (B_.)*tan[(e_.) +
 (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2
- a*b*B + a^2*C)*(a + b*Tan[e + f*x])^(m + 1))/(b*f*(m + 1)*(a^2 + b^2)), x
] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])^(m + 1)*Simp[b*B + a*(A -
C) - (A*b - a*B - b*C)*Tan[e + f*x], x], x], x] /; FreeQ[{a, b, e, f, A, B,
 C}, x] && NeQ[A*b^2 - a*b*B + a^2*C, 0] && LtQ[m, -1] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+b\cot(c+dx))^3}{(e\cot(c+dx))^{9/2}}\,dx = \frac{2a^2(a+b\cot(c+dx))}{7de(e\cot(c+dx))^{7/2}} - \frac{2\int \frac{-8a^2be^2+\frac{7}{2}a\left(a^2-3b^2\right)e^2\cot(c+dx)+\frac{1}{2}b\left(5a^2-7b^2\right)e^2\cot^2(c+dx)}{(e\cot(c+dx))^{7/2}}\,dx}{7e^3}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} + \frac{2a^2(a+b\cot(c+dx))}{7de(e\cot(c+dx))^{7/2}} - \frac{2\int \frac{\frac{7}{2}a\left(a^2-3b^2\right)e^3+\frac{7}{2}b\left(3a^2-b^2\right)e^3\cot(c+}{(e\cot(c+dx))^{5/2}}}{7e^5}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} - \frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}} + \frac{2a^2(a+b\cot(c+dx))}{7de(e\cot(c+dx))^{7/2}} - \frac{2\int \frac{\frac{7}{2}b(3}{}}{}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} - \frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{de^4\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\,\mathrm{c}}{7de(e\cot(}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} - \frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{de^4\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\,\mathrm{c}}{7de(e\cot(}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} - \frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{de^4\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\,\mathrm{c}}{7de(e\cot(}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} - \frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{de^4\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\,\mathrm{c}}{7de(e\cot(}$$

$$= \frac{32a^2b}{35de^2(e\cot(c+dx))^{5/2}} - \frac{2a\left(a^2-3b^2\right)}{3de^3(e\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{de^4\sqrt{e\cot(c+dx)}} + \frac{2a^2(a+b\,\mathrm{c}}{7de(e\cot(}$$

$$= \frac{(a-b)\left(a^2+4ab+b^2\right)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,de^{9/2}} - \frac{(a-b)\left(a^2+4ab+b^2\right)\tan^{-1}\left(1\right.}{\sqrt{2}\,de^{9/2}}$$

Mathematica [C] time = 0.68, size = 116, normalized size = 0.31

$$\frac{2\tan^4(c+dx)\sqrt{e\cot(c+dx)}\left(5a\left(a^2-3b^2\right)\,{}_2F_1\left(-\frac{7}{4},1;-\frac{3}{4};-\cot^2(c+dx)\right)+b\left(7\left(3a^2-b^2\right)\cot(c+dx)\,{}_2F_1\left(-\frac{5}{4}\right.\right.\right.}{35de^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^3/(e*Cot[c + d*x])^(9/2),x]
```

```
[Out] (2*Sqrt[e*Cot[c + d*x]]*(5*a*(a^2 - 3*b^2)*Hypergeometric2F1[-7/4, 1, -3/4,
 -Cot[c + d*x]^2] + b*(b*(15*a + 7*b*Cot[c + d*x]) + 7*(3*a^2 - b^2)*Cot[c
```

```
+ d*x]*Hypergeometric2F1[-5/4, 1, -1/4, -Cot[c + d*x]^2]))*Tan[c + d*x]^4)/
(35*d*e^5)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\cot(dx+c)+a)^3}{(e\cot(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x, algorithm="giac")
[Out] integrate((b*cot(d*x + c) + a)^3/(e*cot(d*x + c))^(9/2), x)
```

maple [B] time = 0.45, size = 829, normalized size = 2.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x)
[Out] 1/2/d*a^3/e^5*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)+1)-3/2/d/e^5*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)+1)*a*b^2-1/4/d*a^3/e^5*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(
1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+3/4/d/e^5*(e^2)^(1/4)*2^(1/
2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(
e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2-1
/2/d*a^3/e^5*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)+1)+3/2/d/e^5*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)*a*b^2-3/4/d/e^4*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(
1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b+1/4/d/e^4*2^(1/2)/(e^2)^(1/4
)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e
*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3+3/2/
d/e^4*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
```

```
1)*a^2*b-1/2/d/e^4*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)*b^3-3/2/d/e^4*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d/e^4*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2
)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+2/7/d*a^3/e/(e*cot(d*x+c))^(7/2)+
6/5*a^2*b/d/e^2/(e*cot(d*x+c))^(5/2)-2/3*a^3/d/e^3/(e*cot(d*x+c))^(3/2)+2/d
/e^3*a/(e*cot(d*x+c))^(3/2)*b^2-6/d/e^4*b/(e*cot(d*x+c))^(1/2)*a^2+2/d/e^4*
b^3/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.77, size = 342, normalized size = 0.91

$$-\frac{e\left(\frac{105\left(\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3+3a^2b-3ab^2-b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\cdots}{\cdots}\right)}{e^5}\cdots\right)}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^3/(e*cot(d*x+c))^(9/2),x, algorithm="maxima")
```

```
[Out] -1/420*e*(105*(2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)
*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a
^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt
(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3
)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) -
sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x
 + c)) + e + e/tan(d*x + c))/sqrt(e))/e^5 - 8*(15*a^3*e^3 + 63*a^2*b*e^3/ta
n(d*x + c) - 35*(a^3 - 3*a*b^2)*e^3/tan(d*x + c)^2 - 105*(3*a^2*b - b^3)*e^
3/tan(d*x + c)^3)/(e^5*(e/tan(d*x + c))^(7/2)))/d
```

mupad [B] time = 5.26, size = 1992, normalized size = 5.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^3/(e*cot(c + d*x))^(9/2),x)
```

```
[Out] atan((((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^14 - 16*b^6*d^3*e^14 + 240*a^2*
b^4*d^3*e^14 - 240*a^4*b^2*d^3*e^14) + (32*a^3*d^4*e^19 - 96*a*b^2*d^4*e^19
```

```
)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^
2)*1i)/(4*d^2*e^9))^(1/2))*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4
- a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2)*1i + ((e*cot(c + d*x))^(
1/2)*(16*a^6*d^3*e^14 - 16*b^6*d^3*e^14 + 240*a^2*b^4*d^3*e^14 - 240*a^4*b^
2*d^3*e^14) - (32*a^3*d^4*e^19 - 96*a*b^2*d^4*e^19)*(((a*b^5*6i + a^5*b*6i
- a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2)
)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^
2)*1i)/(4*d^2*e^9))^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^14 - 1
6*b^6*d^3*e^14 + 240*a^2*b^4*d^3*e^14 - 240*a^4*b^2*d^3*e^14) + (32*a^3*d^4
*e^19 - 96*a*b^2*d^4*e^19)*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4
- a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2))*(((a*b^5*6i + a^5*b*6i
- a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2)
 - ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^14 - 16*b^6*d^3*e^14 + 240*a^2*b^4
*d^3*e^14 - 240*a^4*b^2*d^3*e^14) - (32*a^3*d^4*e^19 - 96*a*b^2*d^4*e^19)*(
((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*
1i)/(4*d^2*e^9))^(1/2))*(((a*b^5*6i + a^5*b*6i - a^6 + b^6 - 15*a^2*b^4 - a
^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2) - 16*b^9*d^2*e^10 + 48*a^8*
b*d^2*e^10 + 96*a^4*b^5*d^2*e^10 + 128*a^6*b^3*d^2*e^10))*(((a*b^5*6i + a^5
*b*6i - a^6 + b^6 - 15*a^2*b^4 - a^3*b^3*20i + 15*a^4*b^2)*1i)/(4*d^2*e^9))
^(1/2)*2i + atan((((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^14 - 16*b^6*d^3*e^1
4 + 240*a^2*b^4*d^3*e^14 - 240*a^4*b^2*d^3*e^14) + (32*a^3*d^4*e^19 - 96*a*
b^2*d^4*e^19)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i
 - 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 +
 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2)*1i + ((e*cot
(c + d*x))^(1/2)*(16*a^6*d^3*e^14 - 16*b^6*d^3*e^14 + 240*a^2*b^4*d^3*e^14
- 240*a^4*b^2*d^3*e^14) - (32*a^3*d^4*e^19 - 96*a*b^2*d^4*e^19)*(((a*b^5*6i
 + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2
*e^9))^(1/2))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i
 - 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)*(16*a^6*
d^3*e^14 - 16*b^6*d^3*e^14 + 240*a^2*b^4*d^3*e^14 - 240*a^4*b^2*d^3*e^14) +
 (32*a^3*d^4*e^19 - 96*a*b^2*d^4*e^19)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 +
 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2))*(((a*b^5*6i
 + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2
*e^9))^(1/2) - ((e*cot(c + d*x))^(1/2)*(16*a^6*d^3*e^14 - 16*b^6*d^3*e^14 +
 240*a^2*b^4*d^3*e^14 - 240*a^4*b^2*d^3*e^14) - (32*a^3*d^4*e^19 - 96*a*b^2
*d^4*e^19)*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i -
15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2))*(((a*b^5*6i + a^5*b*6i + a^6 - b^6 + 15
*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/(4*d^2*e^9))^(1/2) - 16*b^9*d^2*e^
10 + 48*a^8*b*d^2*e^10 + 96*a^4*b^5*d^2*e^10 + 128*a^6*b^3*d^2*e^10))*(((a*
b^5*6i + a^5*b*6i + a^6 - b^6 + 15*a^2*b^4 - a^3*b^3*20i - 15*a^4*b^2)*1i)/
(4*d^2*e^9))^(1/2)*2i + ((2*a^3*e)/7 + (2*e*cot(c + d*x)^2*(3*a*b^2 - a^3))
/3 - 2*e*cot(c + d*x)^3*(3*a^2*b - b^3) + (6*a^2*b*e*cot(c + d*x))/5)/(d*e^
2*(e*cot(c + d*x))^(7/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\cot(c + dx))^3}{(e\cot(c + dx))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**3/(e*cot(d*x+c))**(9/2),x)
[Out] Integral((a + b*cot(c + d*x))**3/(e*cot(c + d*x))**(9/2), x)
```

3.69 $\int \frac{(e\cot(c+dx))^{5/2}}{a+b\cot(c+dx)}\,dx$

Optimal. Leaf size=325

$$\frac{e^{5/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)}-\frac{e^{5/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}\right.}{2\sqrt{2}d\left(a^2+b^2\right)}$$

```
[Out] 2*a^(5/2)*e^(5/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/b^(3
/2)/(a^2+b^2)/d-1/2*(a+b)*e^(5/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(
1/2))/(a^2+b^2)/d*2^(1/2)+1/2*(a+b)*e^(5/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))
^(1/2)/e^(1/2))/(a^2+b^2)/d*2^(1/2)+1/4*(a-b)*e^(5/2)*ln(e^(1/2)+cot(d*x+c)
*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d*2^(1/2)-1/4*(a-b)*e^(5/2
)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d*2
^(1/2)-2*e^2*(e*cot(d*x+c))^(1/2)/b/d
```

Rubi [A] time = 0.66, antiderivative size = 325, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3566, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{e^{5/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)}-\frac{e^{5/2}(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}\right.}{2\sqrt{2}d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)/(a + b*Cot[c + d*x]),x]
```

```
[Out] (2*a^(5/2)*e^(5/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqrt[e])]
)/(b^(3/2)*(a^2 + b^2)*d) - ((a + b)*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot
[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d) + ((a + b)*e^(5/2)*ArcTan[1 +
 (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d) - (2*e^2*
Sqrt[e*Cot[c + d*x]])/(b*d) + ((a - b)*e^(5/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c
+ d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)*d) - ((a - b
)*e^(5/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]
])/(2*Sqrt[2]*(a^2 + b^2)*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
```

```
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3566

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m - 2)*(c
+ d*Tan[e + f*x])^(n + 1))/(d*f*(m + n - 1)), x] + Dist[1/(d*(m + n - 1)),
Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f*x])^n*Simp[a^3*d*(m + n -
 1) - b^2*(b*c*(m - 2) + a*d*(1 + n)) + b*d*(m + n - 1)*(3*a^2 - b^2)*Tan[e
 + f*x] - b^2*(b*c*(m - 2) - a*d*(3*m + 2*n - 4))*Tan[e + f*x]^2, x], x], x
] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && GtQ[m, 2] && (GeQ[n, -1] || In
tegerQ[m]) &&  !(IGtQ[n, 2] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{5/2}}{a+b\cot(c+dx)}\,dx = -\frac{2e^2\sqrt{e\cot(c+dx)}}{bd} - \frac{2\int \frac{\frac{ae^3}{2}+\frac{1}{2}be^3\cot(c+dx)+\frac{1}{2}ae^3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{b}$$

$$= -\frac{2e^2\sqrt{e\cot(c+dx)}}{bd} - \frac{2\int \frac{\frac{b^2e^3}{2}+\frac{1}{2}abe^3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{b\left(a^2+b^2\right)} - \frac{\left(a^3e^3\right)\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{b\left(a^2+b^2\right)}$$

$$= -\frac{2e^2\sqrt{e\cot(c+dx)}}{bd} - \frac{4\,\text{Subst}\left(\int \frac{-\frac{1}{2}b^2e^4-\frac{1}{2}abe^3x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{b\left(a^2+b^2\right)d} - \frac{\left(a^3e^3\right)\text{Subs}}{}$$

$$= -\frac{2e^2\sqrt{e\cot(c+dx)}}{bd} + \frac{\left(2a^3e^2\right)\text{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{b\left(a^2+b^2\right)d} - \frac{\left((a-b)e^3\right)\text{Su}}{}$$

$$= \frac{2a^{5/2}e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{3/2}\left(a^2+b^2\right)d} - \frac{2e^2\sqrt{e\cot(c+dx)}}{bd} + \frac{\left((a-b)e^{5/2}\right)\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{e}+}{-e-\sqrt{2}\sqrt{e}}\right.}{2\sqrt{2}\left(a^2+\right.}$$

$$= \frac{2a^{5/2}e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{3/2}\left(a^2+b^2\right)d} - \frac{2e^2\sqrt{e\cot(c+dx)}}{bd} + \frac{(a-b)e^{5/2}\log\left(\sqrt{e}+\sqrt{e}\cot(c\right.}{2\sqrt{2}\left(a^2\right.}$$

$$= \frac{2a^{5/2}e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{3/2}\left(a^2+b^2\right)d} - \frac{(a+b)e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\left(a^2+b^2\right)d} + \frac{(a+b)e^{5/2}\text{ta}}{\sqrt{}}$$

Mathematica [C] time = 0.87, size = 286, normalized size = 0.88

$$\frac{(e\cot(c+dx))^{5/2}\left(8ab^{3/2}\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-3\left(-8a^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)+8a^2\sqrt{b}\sqrt{\text{co}}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)/(a + b*Cot[c + d*x]),x]
```

```
[Out] ((e*Cot[c + d*x])^(5/2)*(8*a*b^(3/2)*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3
/4, 1, 7/4, -Cot[c + d*x]^2] - 3*(2*Sqrt[2]*b^(5/2)*ArcTan[1 - Sqrt[2]*Sqrt
[Cot[c + d*x]]] - 2*Sqrt[2]*b^(5/2)*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]
- 8*a^(5/2)*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]] + 8*a^2*Sqrt[b]*Sq
rt[Cot[c + d*x]] + 8*b^(5/2)*Sqrt[Cot[c + d*x]] + Sqrt[2]*b^(5/2)*Log[1 - S
```

```
qrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*b^(5/2)*Log[1 + Sqrt[2]
*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])))/(12*b^(3/2)*(a^2 + b^2)*d*Cot[c + d*
x]^(5/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{5}{2}}}{b\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(5/2)/(b*cot(d*x + c) + a), x)
```

maple [A] time = 0.67, size = 459, normalized size = 1.41

$$-\frac{2e^2\sqrt{e\cot(dx+c)}}{bd}+\frac{2e^3a^3\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{db\left(a^2+b^2\right)\sqrt{aeb}}+\frac{e^2b\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{4d\left(a^2+b^2\right)}+\frac{e^2b\left(e^2\right)^{\frac{1}{4}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] -2*e^2*(e*cot(d*x+c))^(1/2)/b/d+2/d*e^3/b*a^3/(a^2+b^2)/(a*e*b)^(1/2)*arcta
n((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+1/4/d*e^2/(a^2+b^2)*b*(e^2)^(1/4)*2
^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2
/d*e^2/(a^2+b^2)*b*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)-1/2/d*e^2/(a^2+b^2)*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d*e^3/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)
*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*
cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d*e^3
/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^
```

```
(1/2)+1)-1/2/d*e^3/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.54, size = 259, normalized size = 0.80

$$\frac{\left(\frac{8\,a^{3}e^{2}\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{2}b+b^{3}\right)\sqrt{abe}}+\frac{\frac{2\sqrt{2}(a+b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}(a+b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}(a-b)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan\cdots}}\cdots\right.}{\sqrt{e}}\cdots}{a^{2}+b^{2}}\cdots\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*(8*a^3*e^2*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a^2*b + b^3)*sq
rt(a*b*e)) + (2*sqrt(2)*(a + b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqr
t(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a + b)*arctan(-1/2*sqrt(2)
*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a -
 b)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e)
+ sqrt(2)*(a - b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x
 + c))/sqrt(e))*e^2/(a^2 + b^2) - 8*e*sqrt(e/tan(d*x + c))/b)*e/d
```

mupad [B] time = 1.97, size = 5579, normalized size = 17.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)/(a + b*cot(c + d*x)),x)
```

```
[Out] (atan(((((32*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^4) + (((3
2*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5) + (
((32*(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*
b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4) - (((32*(4*a*b^8*d^4*e^13 + 8*a
^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) + (32*(e*cot(c + d*x))^(1/2)
*(-a^5*b^3*e^5)^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*
d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b^4*d^5*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2
))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^
3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2)*1i)/(b^3*d*(a^2 + b
```

```
^2)) + (((32*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^4) - (((3
2*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5) - (
((32*(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*
b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4) + (((32*(4*a*b^8*d^4*e^13 + 8*a
^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) - (32*(e*cot(c + d*x))^(1/2)
*(-a^5*b^3*e^5)^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*
d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b^4*d^5*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2
))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^
3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2)*1i)/(b^3*d*(a^2 + b
^2)))/((64*(a^5*e^23 - a^3*b^2*e^23))/(b*d^5) + (((32*(e*cot(c + d*x))^(1/2
)*(2*a^6*e^20 - b^6*e^20))/(b*d^4) + (((32*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2
*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5) + (((32*(e*cot(c + d*x))^(1/2)*(16*a^
7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15)
)/(b*d^4) - (((32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^
13))/(b*d^5) + (32*(e*cot(c + d*x))^(1/2)*(-a^5*b^3*e^5)^(1/2)*(16*b^10*d^4
*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(
b^4*d^5*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*
e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))
*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)) - (((32*(e*cot(c + d*x))^(1/2)*(
2*a^6*e^20 - b^6*e^20))/(b*d^4) - (((32*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^
18 - 15*a^4*b^3*d^2*e^18))/(b*d^5) - (((32*(e*cot(c + d*x))^(1/2)*(16*a^7*b
*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(
b*d^4) + (((32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13)
)/(b*d^5) - (32*(e*cot(c + d*x))^(1/2)*(-a^5*b^3*e^5)^(1/2)*(16*b^10*d^4*e^
10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b^4
*d^5*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5
)^(1/2))/(b^3*d*(a^2 + b^2)))*(-a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2)))*(-
a^5*b^3*e^5)^(1/2))/(b^3*d*(a^2 + b^2))))*(-a^5*b^3*e^5)^(1/2)*2i)/(b^3*d*(
a^2 + b^2)) - atan(((((((32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*
b^4*d^4*e^13))/(b*d^5) - (32*(e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^2*d^2*1i -
a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 1
6*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i -
a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*
e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4
))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(12*a^6*b*d
^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5))*(-e^5/(4*(b^2*d
^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(2*a^6
*e^20 - b^6*e^20))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2))
)^(1/2)*1i - (((((32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4
*e^13))/(b*d^5) + (32*(e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^2*d^2*1i - a^2*d^2
*1i + 2*a*b*d^2)))^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b
^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2
*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 -
14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4))*(-e^
5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(12*a^6*b*d^2*e^18
```

```
+ a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5))*(-e^5/(4*(b^2*d^2*1i -
a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 -
b^6*e^20))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)
*1i)/((((((32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))
/(b*d^5) - (32*(e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2
*a*b*d^2)))^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*
e^10 - 16*a^6*b^4*d^4*e^10))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2
*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^
7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4))*(-e^5/(4*(b
^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(12*a^6*b*d^2*e^18 + a^2*
b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5))*(-e^5/(4*(b^2*d^2*1i - a^2*d^
2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^
20))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + ((((
(32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) +
 (32*(e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2))
)^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*
a^6*b^4*d^4*e^10))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2))
)^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15
 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4))*(-e^5/(4*(b^2*d^2*1i
- a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^
18 - 15*a^4*b^3*d^2*e^18))/(b*d^5))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a
*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^
4))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (64*(a^5*e^23
- a^3*b^2*e^23))/(b*d^5)))*(-e^5/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))
^(1/2)*2i - (2*e^2*(e*cot(c + d*x))^(1/2))/(b*d) - atan(((((((32*(4*a*b^8*d
^4*e^13 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) - (32*(e*cot(c
+ d*x))^(1/2)*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^
10*d^4*e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^
10))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*
(e*cot(c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d
^2*e^15 + 2*a^5*b^3*d^2*e^15))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 +
a*b*d^2*2i)))^(1/2) - (32*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^
3*d^2*e^18))/(b*d^5))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2
) + (32*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^4))*(-(e^5*1i)
/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*1i - (((((32*(4*a*b^8*d^4*e^13
 + 8*a^3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) + (32*(e*cot(c + d*x))
^(1/2)*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^10*d^4*
e^10 + 16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b
*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(
c + d*x))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15
 + 2*a^5*b^3*d^2*e^15))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2
*2i)))^(1/2) - (32*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e
^18))/(b*d^5))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32
*(e*cot(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^4))*(-(e^5*1i)/(4*(b^
2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*1i)/((((((32*(4*a*b^8*d^4*e^13 + 8*a^
```

```
3*b^6*d^4*e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) - (32*(e*cot(c + d*x))^(1/2)*
(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^10*d^4*e^10 +
16*a^2*b^8*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b*d^4))*
(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c + d*x
))^(1/2)*(16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^
5*b^3*d^2*e^15))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^
(1/2) - (32*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(
b*d^5))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot
(c + d*x))^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 -
 a^2*d^2 + a*b*d^2*2i)))^(1/2) + (((((32*(4*a*b^8*d^4*e^13 + 8*a^3*b^6*d^4*
e^13 + 4*a^5*b^4*d^4*e^13))/(b*d^5) + (32*(e*cot(c + d*x))^(1/2)*(-(e^5*1i)
/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^10*d^4*e^10 + 16*a^2*b^8
*d^4*e^10 - 16*a^4*b^6*d^4*e^10 - 16*a^6*b^4*d^4*e^10))/(b*d^4))*(-(e^5*1i)
/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(
16*a^7*b*d^2*e^15 - 14*a*b^7*d^2*e^15 + 4*a^3*b^5*d^2*e^15 + 2*a^5*b^3*d^2*
e^15))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (3
2*(12*a^6*b*d^2*e^18 + a^2*b^5*d^2*e^18 - 15*a^4*b^3*d^2*e^18))/(b*d^5))*(-
(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x))
^(1/2)*(2*a^6*e^20 - b^6*e^20))/(b*d^4))*(-(e^5*1i)/(4*(b^2*d^2 - a^2*d^2 +
 a*b*d^2*2i)))^(1/2) - (64*(a^5*e^23 - a^3*b^2*e^23))/(b*d^5)))*(-(e^5*1i)/
(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*2i
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \cot(c+dx))^{\frac{5}{2}}}{a+b\cot(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] Integral((e*cot(c + d*x))**(5/2)/(a + b*cot(c + d*x)), x)
```

3.70 $\int \frac{(e \cot(c+dx))^{3/2}}{a+b \cot(c+dx)} \, dx$

Optimal. Leaf size=302

$$-\frac{e^{3/2}(a+b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)}+\frac{e^{3/2}(a+b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+a}\right.}{2\sqrt{2}d\left(a^2+b^2\right)}$$

```
[Out] -1/2*(a-b)*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)
/d*2^(1/2)+1/2*(a-b)*e^(3/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))
/(a^2+b^2)/d*2^(1/2)-1/4*(a+b)*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2
)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d*2^(1/2)+1/4*(a+b)*e^(3/2)*ln(e^(1/2)+co
t(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d*2^(1/2)-2*a^(3/2
)*e^(3/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/(a^2+b^2)/d/
b^(1/2)
```

Rubi [A] time = 0.38, antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3573, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{e^{3/2}(a+b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)}+\frac{e^{3/2}(a+b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+a}\right.}{2\sqrt{2}d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)/(a + b*Cot[c + d*x]),x]
```

```
[Out] (-2*a^(3/2)*e^(3/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqrt[e])
])/(Sqrt[b]*(a^2 + b^2)*d) - ((a - b)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Co
t[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d) + ((a - b)*e^(3/2)*ArcTan[1
+ (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d) - ((a +
b)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]
]])/(2*Sqrt[2]*(a^2 + b^2)*d) + ((a + b)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[
c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
```

```
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3573

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(3/2)/((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[Simp[a^2*c - b^2*c + 2
*a*b*d + (2*a*b*c - a^2*d + b^2*d)*Tan[e + f*x], x]/Sqrt[a + b*Tan[e + f*x]
], x], x] + Dist[(b*c - a*d)^2/(c^2 + d^2), Int[(1 + Tan[e + f*x]^2)/(Sqrt[
a + b*Tan[e + f*x]]*(c + d*Tan[e + f*x])), x], x] /; FreeQ[{a, b, c, d, e,
f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{3/2}}{a+b\cot(c+dx)}\,dx = \frac{\int \frac{-ae^2+be^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{a^2+b^2} + \frac{(a^2e^2)\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{a^2+b^2}$$

$$= \frac{2\,\text{Subst}\left(\int \frac{ae^3-be^2x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{(a^2+b^2)\,d} + \frac{(a^2e^2)\,\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-bx)}\,dx, x, -\cot(c+$$

$$= -\frac{(2a^2e)\,\text{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{(a^2+b^2)\,d} + \frac{((a-b)e^2)\,\text{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx, x, \sqrt{e\,\text{co}$$

$$= -\frac{2a^{3/2}e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{\sqrt{b}\,(a^2+b^2)\,d} - \frac{((a+b)e^{3/2})\,\text{Subst}\left(\int \frac{\sqrt{2}\,\sqrt{e}+2x}{-e-\sqrt{2}\,\sqrt{e}\,x-x^2}\,dx, x, \sqrt{e\cot(c+}{2\sqrt{2}\,(a^2+b^2)\,d}$$

$$= -\frac{2a^{3/2}e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{\sqrt{b}\,(a^2+b^2)\,d} - \frac{(a+b)e^{3/2}\log\left(\sqrt{e}+\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c}{2\sqrt{2}\,(a^2+b^2)\,d}$$

$$= -\frac{2a^{3/2}e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{\sqrt{b}\,(a^2+b^2)\,d} - \frac{(a-b)e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,(a^2+b^2)\,d} + \frac{(a-b)e^{3/2}\,\text{ta}}{\sqrt{}}$$

Mathematica [C] time = 0.57, size = 249, normalized size = 0.82

$$-\frac{(e\cot(c+dx))^{3/2}\left(3a\left(8\sqrt{a}\,\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)+\sqrt{2}\,\sqrt{b}\,\log\left(\cot(c+dx)-\sqrt{2}\,\sqrt{\cot(c+dx)}+1\right)-\sqrt{2}\,\sqrt{b}\,\text{lo}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)/(a + b*Cot[c + d*x]),x]
```

```
[Out] -1/12*((e*Cot[c + d*x])^(3/2)*(8*b^(3/2)*Cot[c + d*x]^(3/2)*Hypergeometric2
F1[3/4, 1, 7/4, -Cot[c + d*x]^2] + 3*a*(2*Sqrt[2]*Sqrt[b]*ArcTan[1 - Sqrt[2
]*Sqrt[Cot[c + d*x]]] - 2*Sqrt[2]*Sqrt[b]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d
*x]]] + 8*Sqrt[a]*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]] + Sqrt[2]*Sq
rt[b]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Sqrt[b]*
Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])))/(Sqrt[b]*(a^2 + b^2)*
d*Cot[c + d*x]^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{3}{2}}}{b\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(3/2)/(b*cot(d*x + c) + a), x)
```

maple [A] time = 0.69, size = 429, normalized size = 1.42

$$-\frac{2e^{2}a^{2}\arctan\left(\frac{\sqrt{e\cot(dx+c)}\;b}{\sqrt{aeb}}\right)}{d\left(a^{2}+b^{2}\right)\sqrt{aeb}}+\frac{ea\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\;\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\;\sqrt{2}+\sqrt{e^{2}}}\right)}{4d\left(a^{2}+b^{2}\right)}+\frac{ea\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\;\arctan\left(\frac{\sqrt{2}\;\sqrt{e\,\mathrm{co}}}{\left(e^{2}\right)}\right.}{2d\left(a^{2}+b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] -2/d*e^2*a^2/(a^2+b^2)/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^
(1/2))+1/4/d*e/(a^2+b^2)*a*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)
*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d*e/(a^2+b^2)*a*(e^2)^(1/4)*2^(1/2
)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d*e/(a^2+b^2)*a*(e
^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d
*e^2/(a^2+b^2)*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)*2^(1/2)+(e^2)^(1/2)))-1/2/d*e^2/(a^2+b^2)*b/(e^2)^(1/4)*2^(1/2)*arctan
(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*e^2/(a^2+b^2)*b/(e^2)^(1
/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.49, size = 236, normalized size = 0.78

$$-\frac{\Bigg(\frac{8a^2e\arctan\Big(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\Big)}{\sqrt{abe}\,(a^2+b^2)} - \frac{\Bigg(\frac{2\sqrt{2}(a-b)\arctan\Big(\frac{\sqrt{2}\big(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\big)}{2\sqrt{e}}\Big)}{\sqrt{e}} + \frac{2\sqrt{2}(a-b)\arctan\Big(-\frac{\sqrt{2}\big(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\big)}{2\sqrt{e}}\Big)}{\sqrt{e}} + \frac{\sqrt{2}(a+b)\log\big(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(\cdots}}}{\sqrt{e}} \cdots}{a^2+b^2} \cdots}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/4*(8*a^2*e*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/(sqrt(a*b*e)*(a^2
+ b^2)) - (2*sqrt(2)*(a - b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e
/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a - b)*arctan(-1/2*sqrt(2)*(s
qrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a + b)
*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - s
qrt(2)*(a + b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x +
c))/sqrt(e))*e/(a^2 + b^2))*e/d
```

mupad [B] time = 1.63, size = 5129, normalized size = 16.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)/(a + b*cot(c + d*x)),x)
```

```
[Out] atan((((((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^12
))/d^5 - (32*(e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d
^2*2i)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10
 - 16*a^6*b^3*d^4*e^10))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)
))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*e^
13 + 14*a^5*b^2*d^2*e^13))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2
i)))^(1/2) + (32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15))
/d^5)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c
+ d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d
^2 + a*b*d^2*2i)))^(1/2)*1i - (((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e
^12 + 4*a^6*b^2*d^4*e^12))/d^5 + (32*(e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b
```

```
^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^
10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*((e^3*1i)/(4*(b^2*d^2
 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2
*e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13))/d^4)*((e^3*1i)/(4*(b^2*d
^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15
 - 15*a^3*b^3*d^2*e^15))/d^5)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)
))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*((e^3
*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*1i)/((((((32*(4*a^2*b^6*d^
4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5 - (32*(e*cot(c + d*x
))^(1/2)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^9*d^4*
e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^
4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c + d
*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13))/
d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(a*b^5*d^2
*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15))/d^5)*((e^3*1i)/(4*(b^2*d^2
 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^16 + 2
*a^4*b*e^16))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) +
(((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5
 + (32*(e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)
))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*
a^6*b^3*d^4*e^10))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/
2) - (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*e^13 + 1
4*a^5*b^2*d^2*e^13))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(
1/2) + (32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15))/d^5)*
((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c + d*x)
)^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*((e^3*1i)/(4*(b^2*d^2 - a^2*d^2 + a
*b*d^2*2i)))^(1/2) + (64*a^2*b^2*e^18)/d^5))*((e^3*1i)/(4*(b^2*d^2 - a^2*d^
2 + a*b*d^2*2i)))^(1/2)*2i + atan(((((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*
d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5 - (32*(e*cot(c + d*x))^(1/2)*(e^3/(4*(b
^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d
^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(e^3/(4*(b^2*d^2
*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(14*a*b^
6*d^2*e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13))/d^4)*(e^3/(4*(b^2*d
^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2
*e^15 - 15*a^3*b^3*d^2*e^15))/d^5)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b
*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*
(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*1i - (((((32*(4*a^2*b
^6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5 + (32*(e*cot(c
+ d*x))^(1/2)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9
*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10
))/d^4)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(
c + d*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^
13))/d^4)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(a*b^
5*d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15))/d^5)*(e^3/(4*(b^2*d^2
*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^1
```

```
6 + 2*a^4*b*e^16))/d^4)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/
2)*1i)/((((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^
12))/d^5 - (32*(e*cot(c + d*x))^(1/2)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*
a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^
10 - 16*a^6*b^3*d^4*e^10))/d^4)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^
2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*
e^13 + 14*a^5*b^2*d^2*e^13))/d^4)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*
d^2)))^(1/2) + (32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15
))/d^5)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(
c + d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*(e^3/(4*(b^2*d^2*1i - a^2*d
^2*1i + 2*a*b*d^2)))^(1/2) + (((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e^
12 + 4*a^6*b^2*d^4*e^12))/d^5 + (32*(e*cot(c + d*x))^(1/2)*(e^3/(4*(b^2*d^2
*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^1
0 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(e^3/(4*(b^2*d^2*1i -
a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2*
e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13))/d^4)*(e^3/(4*(b^2*d^2*1i
- a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15
- 15*a^3*b^3*d^2*e^15))/d^5)*(e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2))
)^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*(e^3/(
4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (64*a^2*b^2*e^18)/d^5))*(
e^3/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*2i - (atan(-((((((32*(
a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15))/d^5 + (((((32*(4*
a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5 - (32*(e*c
ot(c + d*x))^(1/2)*(-a^3*b*e^3)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^1
0 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/(d^4*(b^3*d + a^2*b*d)))*(-
a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d) + (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*
d^2*e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13))/d^4)*(-a^3*b*e^3)^(1/
2))/(b^3*d + a^2*b*d))*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d) - (32*(e*cot(c
 + d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*(-a^3*b*e^3)^(1/2)*1i)/(b^3*
d + a^2*b*d) - (((((32*(a*b^5*d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*
e^15))/d^5 + (((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d
^4*e^12))/d^5 + (32*(e*cot(c + d*x))^(1/2)*(-a^3*b*e^3)^(1/2)*(16*b^9*d^4*e
^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/(d^
4*(b^3*d + a^2*b*d)))*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d) - (32*(e*cot(c
+ d*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13
))/d^4)*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d))*(-a^3*b*e^3)^(1/2))/(b^3*d +
 a^2*b*d) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*(-a^
3*b*e^3)^(1/2)*1i)/(b^3*d + a^2*b*d))/((((((32*(a*b^5*d^2*e^15 + 4*a^5*b*d^
2*e^15 - 15*a^3*b^3*d^2*e^15))/d^5 + (((((32*(4*a^2*b^6*d^4*e^12 + 8*a^4*b^
4*d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5 - (32*(e*cot(c + d*x))^(1/2)*(-a^3*b*
e^3)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 1
6*a^6*b^3*d^4*e^10))/(d^4*(b^3*d + a^2*b*d)))*(-a^3*b*e^3)^(1/2))/(b^3*d +
a^2*b*d) + (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2*e^13 - 4*a^3*b^4*d^2*e^
13 + 14*a^5*b^2*d^2*e^13))/d^4)*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d))*(-a^
3*b*e^3)^(1/2))/(b^3*d + a^2*b*d) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^16 +
```

```
2*a^4*b*e^16))/d^4)*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d) + (((((32*(a*b^5*
d^2*e^15 + 4*a^5*b*d^2*e^15 - 15*a^3*b^3*d^2*e^15))/d^5 + (((((32*(4*a^2*b^
6*d^4*e^12 + 8*a^4*b^4*d^4*e^12 + 4*a^6*b^2*d^4*e^12))/d^5 + (32*(e*cot(c +
 d*x))^(1/2)*(-a^3*b*e^3)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16
*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/(d^4*(b^3*d + a^2*b*d)))*(-a^3*b*
e^3)^(1/2))/(b^3*d + a^2*b*d) - (32*(e*cot(c + d*x))^(1/2)*(14*a*b^6*d^2*e^
13 - 4*a^3*b^4*d^2*e^13 + 14*a^5*b^2*d^2*e^13))/d^4)*(-a^3*b*e^3)^(1/2))/(b
^3*d + a^2*b*d))*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b*d) + (32*(e*cot(c + d*x
))^(1/2)*(b^5*e^16 + 2*a^4*b*e^16))/d^4)*(-a^3*b*e^3)^(1/2))/(b^3*d + a^2*b
*d) + (64*a^2*b^2*e^18)/d^5))*(-a^3*b*e^3)^(1/2)*2i)/(b^3*d + a^2*b*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(c+dx))^{\frac{3}{2}}}{a+b\cot(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)/(a + b*cot(c + d*x)), x)
```

3.71 $\int \frac{\sqrt{e\cot(c+dx)}}{a+b\cot(c+dx)}\,dx$

Optimal. Leaf size=302

$$-\frac{\sqrt{e}\,(a-b)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}\,+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)}+\frac{\sqrt{e}\,(a-b)\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx)}\right.}{2\sqrt{2}\,d\left(a^2+b^2\right)}$$

```
[Out] 1/2*(a+b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/(a^2+b^2)/
d*2^(1/2)-1/2*(a+b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/
(a^2+b^2)/d*2^(1/2)-1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(
d*x+c))^(1/2))*e^(1/2)/(a^2+b^2)/d*2^(1/2)+1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)*
e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/(a^2+b^2)/d*2^(1/2)+2*arctan(
b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*a^(1/2)*b^(1/2)*e^(1/2)/(a^2+
b^2)/d
```

Rubi [A] time = 0.38, antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3572, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{\sqrt{e}\,(a-b)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}\,+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)}+\frac{\sqrt{e}\,(a-b)\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx)}\right.}{2\sqrt{2}\,d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]/(a + b*Cot[c + d*x]),x]
```

```
[Out] (2*Sqrt[a]*Sqrt[b]*Sqrt[e]*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*S
qrt[e])])/((a^2 + b^2)*d) + ((a + b)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot
[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d) - ((a + b)*Sqrt[e]*ArcTan[1 +
 (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d) - ((a - b
)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]
])/(2*Sqrt[2]*(a^2 + b^2)*d) + ((a - b)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c
 + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
```

```
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3572

```
Int[Sqrt[(a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)]]/((c_.) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[Simp[a*c + b*d + (b*c -
a*d)*Tan[e + f*x], x]/Sqrt[a + b*Tan[e + f*x]], x], x] - Dist[(d*(b*c - a*d
))/(c^2 + d^2), Int[(1 + Tan[e + f*x]^2)/(Sqrt[a + b*Tan[e + f*x]]*(c + d*T
an[e + f*x])), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && NeQ
[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rubi steps

$$\int \frac{\sqrt{e\cot(c+dx)}}{a+b\cot(c+dx)}\,dx = \frac{\int \frac{be+ae\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{a^2+b^2} - \frac{(abe)\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{a^2+b^2}$$

$$= \frac{2\,\text{Subst}\left(\int \frac{-be^2-aex^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{(a^2+b^2)\,d} - \frac{(abe)\,\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-bx)}\,dx, x, -\cot(c+\right.}{(a^2+b^2)\,d}$$

$$= \frac{(2ab)\,\text{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{(a^2+b^2)\,d} + \frac{((a-b)e)\,\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c\right.}{(a^2+b^2)\,d}$$

$$= \frac{2\sqrt{a}\,\sqrt{b}\,\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{(a^2+b^2)\,d} - \frac{\left((a-b)\sqrt{e}\right)\text{Subst}\left(\int \frac{\sqrt{2}\,\sqrt{e}+2x}{-e-\sqrt{2}\,\sqrt{e}\,x-x^2}\,dx, x, \sqrt{e\cot(\right.}{2\sqrt{2}\,(a^2+b^2)\,d}$$

$$= \frac{2\sqrt{a}\,\sqrt{b}\,\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{(a^2+b^2)\,d} - \frac{(a-b)\sqrt{e}\,\log\left(\sqrt{e}+\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot\right.}{2\sqrt{2}\,(a^2+b^2)\,d}$$

$$= \frac{2\sqrt{a}\,\sqrt{b}\,\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{(a^2+b^2)\,d} + \frac{(a+b)\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,(a^2+b^2)\,d} - \frac{(a+b)\sqrt{e}}{}$$

Mathematica [C] time = 0.28, size = 226, normalized size = 0.75

$$\frac{\sqrt{e\cot(c+dx)}\left(24\sqrt{a}\,\sqrt{b}\,\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)-8a\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)+3\sqrt{2}\,b\log\left(\cot(c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]/(a + b*Cot[c + d*x]),x]
```

```
[Out] (Sqrt[e*Cot[c + d*x]]*(6*Sqrt[2]*b*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] -
 6*Sqrt[2]*b*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 24*Sqrt[a]*Sqrt[b]*Ar
cTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]] - 8*a*Cot[c + d*x]^(3/2)*Hyperge
ometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2] + 3*Sqrt[2]*b*Log[1 - Sqrt[2]*Sqrt
[Cot[c + d*x]] + Cot[c + d*x]] - 3*Sqrt[2]*b*Log[1 + Sqrt[2]*Sqrt[Cot[c + d
*x]] + Cot[c + d*x]]))/(12*(a^2 + b^2)*d*Sqrt[Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cot(dx+c)}}{b\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cot(d*x + c))/(b*cot(d*x + c) + a), x)
```

maple [A] time = 0.79, size = 417, normalized size = 1.38

$$\frac{2eab\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{d\left(a^2+b^2\right)\sqrt{aeb}}-\frac{b\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{4d\left(a^2+b^2\right)}-\frac{b\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}\right.}{2d\left(a^2+b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] 2/d*e*a*b/(a^2+b^2)/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/
2))-1/4/d/(a^2+b^2)*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+
c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/2/d/(a^2+b^2)*b*(e^2)^(1/4)*2^(1/2)*arcta
n(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d/(a^2+b^2)*b*(e^2)^(1/4)
*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/4/d*e/(a^2+b
^2)*a/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2
)+(e^2)^(1/2)))-1/2/d*e/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*e/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)*arc
tan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.48, size = 233, normalized size = 0.77

$$\frac{\left(\frac{8\,ab\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\sqrt{abe}\left(a^2+b^2\right)} - \frac{\frac{2\sqrt{2}(a+b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}} + \frac{2\sqrt{2}(a+b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}} - \frac{\sqrt{2}(a-b)\log\left(\sqrt{2}\sqrt{e}\sqrt{\frac{e}{\tan(dx}\right.}{\sqrt{e}}}{a^2+b^2}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*(8*a*b*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/(sqrt(a*b*e)*(a^2 + b
^2)) - (2*sqrt(2)*(a + b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/ta
n(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a + b)*arctan(-1/2*sqrt(2)*(sqrt
(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a - b)*lo
g(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt
(2)*(a - b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))
/sqrt(e))/(a^2 + b^2))*e/d
```

mupad [B] time = 1.39, size = 4808, normalized size = 15.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)/(a + b*cot(c + d*x)),x)
```

```
[Out] (atan(((((32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4 - (((3
2*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(e*cot(c + d*x))^(1
/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4 + (
((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 -
 (32*(e*cot(c + d*x))^(1/2)*(-a*b*e)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^
4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/(d^5*(a^2 + b^2)))*(-a
*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/
2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2)*1i)/(d*(a^2 + b^2)) + (((32*(e*cot(c +
d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4 + (((32*(13*a^2*b^4*d^2*e^12 +
 a^4*b^2*d^2*e^12))/d^5 - (((32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11
 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4 - (((32*(12*a*b^7*d^4*e^11
+ 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 + (32*(e*cot(c + d*x))^(1
/2)*(-a*b*e)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*
e^10 - 16*a^6*b^3*d^4*e^10))/(d^5*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b
^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a
```

*b*e)^(1/2)*1i)/(d*(a^2 + b^2)))/((64*a*b^3*e^13)/d^5 - (((32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4 - (((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4 + (((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 - (32*(e*cot(c + d*x))^(1/2)*(-a*b*e)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/(d^5*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)) + (((32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4 + (((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 - (((32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4 - (((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 + (32*(e*cot(c + d*x))^(1/2)*(-a*b*e)^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/(d^5*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2))/(d*(a^2 + b^2)))*(-a*b*e)^(1/2)*2i)/(d*(a^2 + b^2)) - atan(((((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 - (32*(e*cot(c + d*x))^(1/2)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2))*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*1i - (((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 + (32*(e*cot(c + d*x))^(1/2)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2))*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*1i)/((((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 - (32*(e*cot(c + d*x))^(1/2)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2))*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*d^4*e^11 + 24*a^3*b^5*d

```
^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 + (32*(e*cot(c + d*x))^(1/2)*(-e/(4*(b^
2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^
4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(-e/(4*(b^2*d^2*1
i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(20*a^3*b^
4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4)*(-e/(4*(b^2*d^2*
1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2))*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a
*b*d^2)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2*b^3*e^12))/d
^4)*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2) + (64*a*b^3*e^13)/
d^5))*(-e/(4*(b^2*d^2*1i - a^2*d^2*1i + 2*a*b*d^2)))^(1/2)*2i - atan(((((32
*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*d^4*e^11 +
 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 - (32*(e*cot(c + d*x))^(1/
2)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^9*d^4*e^10 +
16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(-(e
*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c + d*x))^(1/
2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4)*(-(
e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2))*(-(e*1i)/(4*(b^2*d^2 - a
^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 - 2*a^2
*b^3*e^12))/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*1i -
(((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*d^4*e
^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 + (32*(e*cot(c + d*x)
)^(1/2)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^9*d^4*e^
10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)
*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x)
)^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11))/d^4
)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2))*(-(e*1i)/(4*(b^2*d^
2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*e^12 -
2*a^2*b^3*e^12))/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*
1i)/((((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^7*
d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 - (32*(e*cot(c +
 d*x))^(1/2)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^9*d
^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))
/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c +
 d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^11)
)/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2))*(-(e*1i)/(4*(b
^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c + d*x))^(1/2)*(b^5*e^
12 - 2*a^2*b^3*e^12))/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(
1/2) + (((32*(13*a^2*b^4*d^2*e^12 + a^4*b^2*d^2*e^12))/d^5 + (((32*(12*a*b^
7*d^4*e^11 + 24*a^3*b^5*d^4*e^11 + 12*a^5*b^3*d^4*e^11))/d^5 + (32*(e*cot(c
 + d*x))^(1/2)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2)*(16*b^9
*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10
))/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) - (32*(e*cot(c
 + d*x))^(1/2)*(20*a^3*b^4*d^2*e^11 - 14*a*b^6*d^2*e^11 + 2*a^5*b^2*d^2*e^1
1))/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2))*(-(e*1i)/(4*
(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))^(1/2) + (32*(e*cot(c + d*x))^(1/2)*(b^5*
e^12 - 2*a^2*b^3*e^12))/d^4)*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)))
```

```
^(1/2) + (64*a*b^3*e^13)/d^5))*(-(e*1i)/(4*(b^2*d^2 - a^2*d^2 + a*b*d^2*2i)
))^(1/2)*2i
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cot(c+dx)}}{a+b\cot(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))/(a + b*cot(c + d*x)), x)
```

3.72 $\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx$

Optimal. Leaf size=302

$$\frac{(a+b)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}\,\left(a^2+b^2\right)}-\frac{(a+b)\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right.}{2\sqrt{2}\,d\sqrt{e}\,\left(a^2+b^2\right)}$$

```
[Out] 1/2*(a-b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)/d*2^(1/2
)/e^(1/2)-1/2*(a-b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2
)/d*2^(1/2)/e^(1/2)+1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(
d*x+c))^(1/2))/(a^2+b^2)/d*2^(1/2)/e^(1/2)-1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*
e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d*2^(1/2)/e^(1/2)-2*b^(3/2)
*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/(a^2+b^2)/d/a^(1/2)/e
^(1/2)
```

Rubi [A] time = 0.37, antiderivative size = 302, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3574, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{(a+b)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}\,\left(a^2+b^2\right)}-\frac{(a+b)\log\left(\sqrt{e}\,\cot(c+dx)+\sqrt{2}\,\sqrt{e\cot(c+dx)}+\sqrt{e}\right.}{2\sqrt{2}\,d\sqrt{e}\,\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])),x]
```

```
[Out] (-2*b^(3/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqrt[e])])/(Sqrt
[a]*(a^2 + b^2)*d*Sqrt[e]) + ((a - b)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*
x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d*Sqrt[e]) - ((a - b)*ArcTan[1 + (Sqrt[
2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d*Sqrt[e]) + ((a +
b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*S
qrt[2]*(a^2 + b^2)*d*Sqrt[e]) - ((a + b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x]
 + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)*d*Sqrt[e])
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
```

```
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3574

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)/((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[1/(c^2 + d^2), Int[(a + b*Tan[e + f*x])^m*
(c - d*Tan[e + f*x]), x], x] + Dist[d^2/(c^2 + d^2), Int[((a + b*Tan[e + f*
x])^m*(1 + Tan[e + f*x]^2))/(c + d*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c,
 d, e, f, m}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2
, 0] &&  !IntegerQ[m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx = \frac{\int \frac{a-b\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{a^2+b^2} + \frac{b^2\int \frac{1+\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{a^2+b^2}$$

$$= \frac{2\,\text{Subst}\left(\int \frac{-ae+bx^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{(a^2+b^2)\,d} + \frac{b^2\,\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-bx)}\,dx,\right.}{(a^2+b^2)\,d}$$

$$= -\frac{(a-b)\,\text{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{(a^2+b^2)\,d} - \frac{(a+b)\,\text{Subst}\left(\int \frac{e-x^2}{e^2+x^4}\right.}{(a^2+}$$

$$= -\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{\sqrt{a}\,(a^2+b^2)\,d\sqrt{e}} - \frac{(a-b)\,\text{Subst}\left(\int \frac{1}{e-\sqrt{2}\,\sqrt{e}\,x+x^2}\,dx, x, \sqrt{e\,c}\right.}{2\,(a^2+b^2)\,d}$$

$$= -\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{\sqrt{a}\,(a^2+b^2)\,d\sqrt{e}} + \frac{(a+b)\log\left(\sqrt{e}+\sqrt{e}\,\cot(c+dx)-\sqrt{2}\right.}{2\sqrt{2}\,(a^2+b^2)\,d\sqrt{e}}$$

$$= -\frac{2b^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{\sqrt{a}\,(a^2+b^2)\,d\sqrt{e}} + \frac{(a-b)\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,(a^2+b^2)\,d\sqrt{e}} - \frac{(a}{}$$

Mathematica [C] time = 0.25, size = 248, normalized size = 0.82

$$-\frac{\sqrt{\cot(c+dx)}\left(-\frac{2b\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)}{3(a^2+b^2)} - \frac{a\left(2\sqrt{2}\log\left(\cot(c+dx)-\sqrt{2}\sqrt{\cot(c+dx)}+1\right)-2\sqrt{2}\log\left(\cot(c+dx)+\sqrt{2}\sqrt{\cot(c+dx)}+\right.\right.}{8(a^2+b^2)}\right.}{d\sqrt{e\cot(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])),x]
```

```
[Out] -((Sqrt[Cot[c + d*x]]*((2*b^(3/2)*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[
a]])/(Sqrt[a]*(a^2 + b^2)) - (2*b*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4,
 1, 7/4, -Cot[c + d*x]^2])/(3*(a^2 + b^2)) - (a*(4*(Sqrt[2]*ArcTan[1 - Sqrt
[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]) +
 2*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - 2*Sqrt[2]*L
og[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/(8*(a^2 + b^2))))/(d*Sq
rt[e*Cot[c + d*x]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(b\cot(dx+c)+a)\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)*sqrt(e*cot(d*x + c))), x)
```

maple [A] time = 0.71, size = 423, normalized size = 1.40

$$-\frac{2b^{2}\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{d\left(a^{2}+b^{2}\right)\sqrt{aeb}}-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}{e\cot(dx+c)-\left(e^{2}\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^{2}}}\right)}{4de\left(a^{2}+b^{2}\right)}-\frac{a\left(e^{2}\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+}}{\left(e^{2}\right)^{\frac{1}{4}}}\right.}{2de\left(a^{2}+b^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] -2/d*b^2/(a^2+b^2)/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2
))-1/4/d/e/(a^2+b^2)*a*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x
+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/2/d/e/(a^2+b^2)*a*(e^2)^(1/4)*2^(1/2)*ar
ctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d/e/(a^2+b^2)*a*(e^2)^
(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/4/d/(a^
2+b^2)*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(
1/2)+(e^2)^(1/2)))+1/2/d/(a^2+b^2)*b/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d/(a^2+b^2)*b/(e^2)^(1/4)*2^(1/2)*arct
an(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.53, size = 239, normalized size = 0.79

$$-\frac{e\left(\frac{8\,b^2\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\sqrt{abe}\,(a^2+b^2)e}+\frac{\frac{2\,\sqrt{2}\,(a-b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\,(a-b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,(a+b)\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(\ldots}}\right.}{\sqrt{e}}}{(a^2+b^2)e}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/4*e*(8*b^2*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/(sqrt(a*b*e)*(a^2
+ b^2)*e) + (2*sqrt(2)*(a - b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt
(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a - b)*arctan(-1/2*sqrt(2)*
(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a +
b)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) -
 sqrt(2)*(a + b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x
+ c))/sqrt(e))/((a^2 + b^2)*e))/d
```

mupad [B] time = 1.77, size = 4871, normalized size = 16.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(1/2)*(a + b*cot(c + d*x))),x)
```

```
[Out] atan((((((((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - ((((1/(b^2*d^2*e*1i - a^2*
d^2*e*1i + 2*a*b*d^2*e))^(1/2)*((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^2*e^10
+ 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 - (16*(e*cot(c + d*x))^(1/2
)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*(16*b^9*d^4*e^10 +
16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4))/2 -
 (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2*a^5*b
^2*d^2*e^9))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2))/2)
*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2))/2 + (96*b^5*e^8*(e*
cot(c + d*x))^(1/2))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(
1/2)*1i)/2 - (((((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - ((((1/(b^2*d^2*e*1i
 - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^
2*e^10 + 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 + (16*(e*cot(c + d*x
))^(1/2)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*(16*b^9*d^4*
e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^
4))/2 + (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 +
```

```
2*a^5*b^2*d^2*e^9))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1
/2))/2)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2))/2 - (96*b^5*
e^8*(e*cot(c + d*x))^(1/2))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^
2*e))^(1/2)*1i)/2)/((((((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - ((((1/(b^2*d
^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*((32*(16*b^8*d^2*e^10 + 28*a^2
*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 - (16*(e*cot(
c + d*x))^(1/2)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*(16*b
^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^
10))/d^4))/2 - (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2
*e^9 + 2*a^5*b^2*d^2*e^9))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2
*e))^(1/2))/2)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2))/2 + (
96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2
*a*b*d^2*e))^(1/2))/2 + (((((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - ((((1/(b
^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*((32*(16*b^8*d^2*e^10 + 28
*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 + (16*(e*
cot(c + d*x))^(1/2)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2)*(
16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^
4*e^10))/d^4))/2 + (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6
*d^2*e^9 + 2*a^5*b^2*d^2*e^9))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b
*d^2*e))^(1/2))/2)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))^(1/2))/2
 - (96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i
 + 2*a*b*d^2*e))^(1/2))/2))*(1/(b^2*d^2*e*1i - a^2*d^2*e*1i + 2*a*b*d^2*e))
^(1/2)*1i + atan(((((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - (((32*(16*b^8*d^
2*e^10 + 28*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^
3 - (32*(e*cot(c + d*x))^(1/2)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i
)))^(1/2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16
*a^6*b^3*d^4*e^10))/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1
/2) - (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2*
a^5*b^2*d^2*e^9))/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2
))*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) + (96*b^5*e^8*(e*c
ot(c + d*x))^(1/2))/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1
/2)*1i - (((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - (((32*(16*b^8*d^2*e^10 +
28*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 + (32*(
e*cot(c + d*x))^(1/2)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2)
*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*
d^4*e^10))/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) + (32
*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2*a^5*b^2*d
^2*e^9))/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2))*(1i/(4
*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) - (96*b^5*e^8*(e*cot(c + d*
x))^(1/2))/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2)*1i)/(
(((32*(5*a*b^5*e^9 + a^3*b^3*e^9))/d^3 - (((32*(16*b^8*d^2*e^10 + 28*a^2*b^
6*d^2*e^10 + 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 - (32*(e*cot(c +
 d*x))^(1/2)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2)*(16*b^9*
d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10)
)/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) - (32*(e*cot(c
```

```
 + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2*a^5*b^2*d^2*e^9))/
d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2))*(1i/(4*(b^2*d^2
*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) + (96*b^5*e^8*(e*cot(c + d*x))^(1/2)
)/d^4)*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) + (((32*(5*a*b
^5*e^9 + a^3*b^3*e^9))/d^3 - (((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^2*e^10 +
 8*a^4*b^4*d^2*e^10 - 4*a^6*b^2*d^2*e^10))/d^3 + (32*(e*cot(c + d*x))^(1/2)
*(1i/(4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2)*(16*b^9*d^4*e^10 + 1
6*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*d^4*e^10))/d^4)*(1i/(
4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2) + (32*(e*cot(c + d*x))^(1/
2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2*a^5*b^2*d^2*e^9))/d^4)*(1i/(4*
(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2))*(1i/(4*(b^2*d^2*e - a^2*d^2
*e + a*b*d^2*e*2i)))^(1/2) - (96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*(1i/(
4*(b^2*d^2*e - a^2*d^2*e + a*b*d^2*e*2i)))^(1/2)))*(1i/(4*(b^2*d^2*e - a^2*
d^2*e + a*b*d^2*e*2i)))^(1/2)*2i + (atan((((((32*(5*a*b^5*e^9 + a^3*b^3*e^
9))/d^3 - (((((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e^
10 - 4*a^6*b^2*d^2*e^10))/d^3 - (32*(e*cot(c + d*x))^(1/2)*(-a*b^3*e)^(1/2)
*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*
d^4*e^10))/(d^4*(a^3*d*e + a*b^2*d*e)))*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*
d*e) - (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2
*a^5*b^2*d^2*e^9))/d^4)*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*d*e))*(-a*b^3*e)
^(1/2))/(a^3*d*e + a*b^2*d*e) + (96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*(-
a*b^3*e)^(1/2)*1i)/(a^3*d*e + a*b^2*d*e) - (((((32*(5*a*b^5*e^9 + a^3*b^3*e
^9))/d^3 - (((((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e
^10 - 4*a^6*b^2*d^2*e^10))/d^3 + (32*(e*cot(c + d*x))^(1/2)*(-a*b^3*e)^(1/2
)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3
*d^4*e^10))/(d^4*(a^3*d*e + a*b^2*d*e)))*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2
*d*e) + (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 +
2*a^5*b^2*d^2*e^9))/d^4)*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*d*e))*(-a*b^3*e
)^(1/2))/(a^3*d*e + a*b^2*d*e) - (96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*(
-a*b^3*e)^(1/2)*1i)/(a^3*d*e + a*b^2*d*e))/((((((32*(5*a*b^5*e^9 + a^3*b^3*
e^9))/d^3 - (((((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*
e^10 - 4*a^6*b^2*d^2*e^10))/d^3 - (32*(e*cot(c + d*x))^(1/2)*(-a*b^3*e)^(1/
2)*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^
3*d^4*e^10))/(d^4*(a^3*d*e + a*b^2*d*e)))*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^
2*d*e) - (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 +
 2*a^5*b^2*d^2*e^9))/d^4)*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*d*e))*(-a*b^3*
e)^(1/2))/(a^3*d*e + a*b^2*d*e) + (96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*
(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*d*e) + (((((32*(5*a*b^5*e^9 + a^3*b^3*e^
9))/d^3 - (((((32*(16*b^8*d^2*e^10 + 28*a^2*b^6*d^2*e^10 + 8*a^4*b^4*d^2*e^
10 - 4*a^6*b^2*d^2*e^10))/d^3 + (32*(e*cot(c + d*x))^(1/2)*(-a*b^3*e)^(1/2)
*(16*b^9*d^4*e^10 + 16*a^2*b^7*d^4*e^10 - 16*a^4*b^5*d^4*e^10 - 16*a^6*b^3*
d^4*e^10))/(d^4*(a^3*d*e + a*b^2*d*e)))*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*
d*e) + (32*(e*cot(c + d*x))^(1/2)*(4*a^3*b^4*d^2*e^9 - 30*a*b^6*d^2*e^9 + 2
*a^5*b^2*d^2*e^9))/d^4)*(-a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*d*e))*(-a*b^3*e)
^(1/2))/(a^3*d*e + a*b^2*d*e) - (96*b^5*e^8*(e*cot(c + d*x))^(1/2))/d^4)*(-
```

```
a*b^3*e)^(1/2))/(a^3*d*e + a*b^2*d*e)))*(-a*b^3*e)^(1/2)*2i)/(a^3*d*e + a*b
^2*d*e)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(1/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] Integral(1/(sqrt(e*cot(c + d*x))*(a + b*cot(c + d*x))), x)
```

3.73 $\int \frac{1}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))}\,dx$

Optimal. Leaf size=325

$$\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)}-\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)}$$

```
[Out] 2*b^(5/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/a^(3/2)/(a^2
+b^2)/d/e^(3/2)-1/2*(a+b)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a
^2+b^2)/d/e^(3/2)*2^(1/2)+1/2*(a+b)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e
^(1/2))/(a^2+b^2)/d/e^(3/2)*2^(1/2)+1/4*(a-b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)
-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d/e^(3/2)*2^(1/2)-1/4*(a-b)*ln(e^(
1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d/e^(3/2)*2
^(1/2)+2/a/d/e/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.66, antiderivative size = 325, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3569, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)}-\frac{(a-b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])),x]
```

```
[Out] (2*b^(5/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqrt[e])])/(a^(3/
2)*(a^2 + b^2)*d*e^(3/2)) - ((a + b)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x
]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d*e^(3/2)) + ((a + b)*ArcTan[1 + (Sqrt[2
]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d*e^(3/2)) + 2/(a*d*
e*Sqrt[e*Cot[c + d*x]]) + ((a - b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqr
t[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)*d*e^(3/2)) - ((a - b)*Lo
g[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2
]*(a^2 + b^2)*d*e^(3/2))
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
```

```
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))}\,dx = \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{2\int \frac{-\frac{be^2}{2}-\frac{1}{2}ae^2\cot(c+dx)-\frac{1}{2}be^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{ae^3}$$

$$= \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{2\int \frac{-\frac{1}{2}abe^2-\frac{1}{2}a^2e^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{a\left(a^2+b^2\right)e^3} - \frac{b^3\int \frac{1+\cot^2}{\sqrt{e\cot(c+dx)}\,(}}{a\left(a^2+\right.}$$

$$= \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{4\,\text{Subst}\left(\int \frac{\frac{1}{2}abe^3+\frac{1}{2}a^2e^2x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{a\left(a^2+b^2\right)de^3}$$

$$= \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{\left(2b^3\right)\text{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{a\left(a^2+b^2\right)de^2} -$$

$$= \frac{2b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{3/2}\left(a^2+b^2\right)de^{3/2}} + \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{(a-b)\,\text{Subst}\left(\right.}{}$$

$$= \frac{2b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{3/2}\left(a^2+b^2\right)de^{3/2}} + \frac{2}{ade\sqrt{e\cot(c+dx)}} + \frac{(a-b)\log\left(\sqrt{e}\right.}{}$$

$$= \frac{2b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{3/2}\left(a^2+b^2\right)de^{3/2}} - \frac{(a+b)\tan^{-1}\left(1-\frac{\sqrt{2}\,\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\,\left(a^2+b^2\right)de^{3/2}} + \frac{(}{}$$

Mathematica [C] time = 0.45, size = 198, normalized size = 0.61

$$\frac{8b^2\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-\frac{b\cot(c+dx)}{a}\right)+a\left(8a\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx)\right)+\sqrt{2}\,b\sqrt{\cot(c+dx)}\,\left(-\log\left(\cot(c+dx)-\sqrt{2}\right.\right.\right.}{4ade}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])),x]
```

```
[Out] (8*b^2*Hypergeometric2F1[-1/2, 1, 1/2, -((b*Cot[c + d*x])/a)] + a*(8*a*Hype
rgeometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] + Sqrt[2]*b*Sqrt[Cot[c + d*x]]
*(-2*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] + 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot
[c + d*x]]] - Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] + Log[1 +
Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])))/(4*a*(a^2 + b^2)*d*e*Sqrt[e*C
ot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(b\cot(dx+c)+a)\,(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)*(e*cot(d*x + c))^(3/2)), x)
```

maple [A] time = 0.61, size = 459, normalized size = 1.41

$$\frac{2b^3\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{dea\left(a^2+b^2\right)\sqrt{aeb}}+\frac{b\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{4d\,e^2\left(a^2+b^2\right)}+\frac{b\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+c)}}{\left(e^2\right)^{\frac{1}{4}}}\cdots\right.}{2d\,e^2\left(a^2+b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] 2/d/e/a*b^3/(a^2+b^2)/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(
1/2))+1/4/d/e^2/(a^2+b^2)*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*co
t(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d/e^2/(a^2+b^2)*b*(e^2)^(1/4)*2^(
1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d/e^2/(a^2+b^2)
*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+
1/4/d/e/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d/e/(a^2+b^2)*a/(e^2)^(1/4)*2^(1/2)*arcta
n(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d/e/(a^2+b^2)*a/(e^2)^(1/
4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2/a/d/e/(e*c
ot(d*x+c))^(1/2)
```

maxima [A] time = 0.91, size = 261, normalized size = 0.80

$$\frac{e\left(\frac{8\,b^{3}\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{3}+ab^{2}\right)\sqrt{abe}\,e^{2}}+\frac{\frac{2\sqrt{2}\,(a+b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\,(a+b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}-\frac{\sqrt{2}\,(a-b)\log\left(\sqrt{2}\,\sqrt{e}\,\sqrt{\frac{e}{\tan(d}}\right.}{\sqrt{e}}}{\left(a^{2}+b^{2}\right)e^{2}}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/4*e*(8*b^3*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a^3 + a*b^2)*sqrt
(a*b*e)*e^2) + (2*sqrt(2)*(a + b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*s
qrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a + b)*arctan(-1/2*sqrt(
2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a
 - b)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e
) + sqrt(2)*(a - b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d
*x + c))/sqrt(e))/((a^2 + b^2)*e^2) + 8/(a*e^2*sqrt(e/tan(d*x + c))))/d
```

mupad [B] time = 1.86, size = 4899, normalized size = 15.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(3/2)*(a + b*cot(c + d*x))),x)
```

```
[Out] (log((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) - (
(-1/(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3))^(1/2)*(((((-1/(b^2*d
^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3))^(1/2)*(((e*cot(c + d*x))^(1/2)
*(-1/(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3))^(1/2)*(512*a^9*b^9*
d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9
*e^19))/2 - 512*a^8*b^9*d^8*e^18 - 640*a^10*b^7*d^8*e^18 + 256*a^12*b^5*d^8
*e^18 + 384*a^14*b^3*d^8*e^18))/2 - (e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7
*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^1
6))*(-1/(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3))^(1/2))/2 - 128*a
^7*b^8*d^6*e^15 + 32*a^11*b^4*d^6*e^15 + 32*a^13*b^2*d^6*e^15))/2)*(-1/(b^2
*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3))^(1/2))/2 - atan(((-1i/(4*(b^
2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(
64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) - (-1i/(4*(b^2*d^2*e^3 - a^2*d^2
*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^
2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(
```

1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19) - 512*a^8*b^9*d^8*e^18 - 640*a^10*b^7*d^8*e^18 + 256*a^12*b^5*d^8*e^18 + 384*a^14*b^3*d^8*e^18) - (e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^16)) - 128*a^7*b^8*d^6*e^15 + 32*a^11*b^4*d^6*e^15 + 32*a^13*b^2*d^6*e^15))*1i + (-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) - (-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19) + 512*a^8*b^9*d^8*e^18 + 640*a^10*b^7*d^8*e^18 - 256*a^12*b^5*d^8*e^18 - 384*a^14*b^3*d^8*e^18) - (e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^16)) + 128*a^7*b^8*d^6*e^15 - 32*a^11*b^4*d^6*e^15 - 32*a^13*b^2*d^6*e^15))*1i)/((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) - (-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19) - 512*a^8*b^9*d^8*e^18 - 640*a^10*b^7*d^8*e^18 + 256*a^12*b^5*d^8*e^18 + 384*a^14*b^3*d^8*e^18) - (e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^16)) - 128*a^7*b^8*d^6*e^15 + 32*a^11*b^4*d^6*e^15 + 32*a^13*b^2*d^6*e^15)) - (-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) - (-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*((-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19) + 512*a^8*b^9*d^8*e^18 + 640*a^10*b^7*d^8*e^18 - 256*a^12*b^5*d^8*e^18 - 384*a^14*b^3*d^8*e^18) - (e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^16)) + 128*a^7*b^8*d^6*e^15 - 32*a^11*b^4*d^6*e^15 - 32*a^13*b^2*d^6*e^15))))*(-1i/(4*(b^2*d^2*e^3 - a^2*d^2*e^3 + a*b*d^2*e^3*2i)))^(1/2)*2i - log((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) - (-1/(4*(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3)))^(1/2)*((-1/(4*(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3)))^(1/2)*((-1/(4*(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3)))^(1/2)*((-1/(4*(b^2*d^2*e^3*1i - a^2*d^2*e^3*1i + 2*a*b*d^2*e^3)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19) + 512*a^8*b^9*d^8*e^

```
18 + 640*a^10*b^7*d^8*e^18 - 256*a^12*b^5*d^8*e^18 - 384*a^14*b^3*d^8*e^18)
 - (e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 1
28*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^16)) + 128*a^7*b^8*d^6*e^15 - 32*a
^11*b^4*d^6*e^15 - 32*a^13*b^2*d^6*e^15))*(-1/(4*(b^2*d^2*e^3*1i - a^2*d^2*
e^3*1i + 2*a*b*d^2*e^3)))^(1/2) - (atan(((((e*cot(c + d*x))^(1/2)*(64*a^7*b
^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) + ((-a^3*b^5*e^3)^(1/2)*((((e*cot(c + d*
x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*
e^16 + 64*a^14*b^2*d^7*e^16) - ((-a^3*b^5*e^3)^(1/2)*(256*a^12*b^5*d^8*e^18
 - 640*a^10*b^7*d^8*e^18 - 512*a^8*b^9*d^8*e^18 + 384*a^14*b^3*d^8*e^18 + (
(e*cot(c + d*x))^(1/2)*(-a^3*b^5*e^3)^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^1
1*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19))/(a^5*d*e^3
 + a^3*b^2*d*e^3)))/(a^5*d*e^3 + a^3*b^2*d*e^3))*(-a^3*b^5*e^3)^(1/2))/(a^5
*d*e^3 + a^3*b^2*d*e^3) + 128*a^7*b^8*d^6*e^15 - 32*a^11*b^4*d^6*e^15 - 32*
a^13*b^2*d^6*e^15))/(a^5*d*e^3 + a^3*b^2*d*e^3))*(-a^3*b^5*e^3)^(1/2)*1i)/(
a^5*d*e^3 + a^3*b^2*d*e^3) + (((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13
 - 32*a^9*b^5*d^5*e^13) + ((-a^3*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(5
12*a^8*b^8*d^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^
14*b^2*d^7*e^16) - ((-a^3*b^5*e^3)^(1/2)*(512*a^8*b^9*d^8*e^18 + 640*a^10*b
^7*d^8*e^18 - 256*a^12*b^5*d^8*e^18 - 384*a^14*b^3*d^8*e^18 + ((e*cot(c + d
*x))^(1/2)*(-a^3*b^5*e^3)^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^
19 - 512*a^13*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19))/(a^5*d*e^3 + a^3*b^2*d
*e^3)))/(a^5*d*e^3 + a^3*b^2*d*e^3))*(-a^3*b^5*e^3)^(1/2))/(a^5*d*e^3 + a^3
*b^2*d*e^3) - 128*a^7*b^8*d^6*e^15 + 32*a^11*b^4*d^6*e^15 + 32*a^13*b^2*d^6
*e^15))/(a^5*d*e^3 + a^3*b^2*d*e^3))*(-a^3*b^5*e^3)^(1/2)*1i)/(a^5*d*e^3 +
a^3*b^2*d*e^3))/((((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5
*d^5*e^13) + ((-a^3*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d
^7*e^16 - 448*a^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e
^16) - ((-a^3*b^5*e^3)^(1/2)*(256*a^12*b^5*d^8*e^18 - 640*a^10*b^7*d^8*e^18
 - 512*a^8*b^9*d^8*e^18 + 384*a^14*b^3*d^8*e^18 + ((e*cot(c + d*x))^(1/2)*(
-a^3*b^5*e^3)^(1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^1
3*b^5*d^9*e^19 - 512*a^15*b^3*d^9*e^19))/(a^5*d*e^3 + a^3*b^2*d*e^3)))/(a^5
*d*e^3 + a^3*b^2*d*e^3))*(-a^3*b^5*e^3)^(1/2))/(a^5*d*e^3 + a^3*b^2*d*e^3)
+ 128*a^7*b^8*d^6*e^15 - 32*a^11*b^4*d^6*e^15 - 32*a^13*b^2*d^6*e^15))/(a^5
*d*e^3 + a^3*b^2*d*e^3))*(-a^3*b^5*e^3)^(1/2))/(a^5*d*e^3 + a^3*b^2*d*e^3)
- (((e*cot(c + d*x))^(1/2)*(64*a^7*b^7*d^5*e^13 - 32*a^9*b^5*d^5*e^13) + ((
-a^3*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(512*a^8*b^8*d^7*e^16 - 448*a
^10*b^6*d^7*e^16 + 128*a^12*b^4*d^7*e^16 + 64*a^14*b^2*d^7*e^16) - ((-a^3*b
^5*e^3)^(1/2)*(512*a^8*b^9*d^8*e^18 + 640*a^10*b^7*d^8*e^18 - 256*a^12*b^5*
d^8*e^18 - 384*a^14*b^3*d^8*e^18 + ((e*cot(c + d*x))^(1/2)*(-a^3*b^5*e^3)^(
1/2)*(512*a^9*b^9*d^9*e^19 + 512*a^11*b^7*d^9*e^19 - 512*a^13*b^5*d^9*e^19
- 512*a^15*b^3*d^9*e^19))/(a^5*d*e^3 + a^3*b^2*d*e^3)))/(a^5*d*e^3 + a^3*b^
2*d*e^3))*(-a^3*b^5*e^3)^(1/2))/(a^5*d*e^3 + a^3*b^2*d*e^3) - 128*a^7*b^8*d
^6*e^15 + 32*a^11*b^4*d^6*e^15 + 32*a^13*b^2*d^6*e^15))/(a^5*d*e^3 + a^3*b^
2*d*e^3))*(-a^3*b^5*e^3)^(1/2))/(a^5*d*e^3 + a^3*b^2*d*e^3)))*(-a^3*b^5*e^3
)^(1/2)*2i)/(a^5*d*e^3 + a^3*b^2*d*e^3) + 2/(a*d*e*(e*cot(c + d*x))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\left(a+b\cot\left(c+dx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(3/2)/(a+b*cot(d*x+c)),x)
[Out] Integral(1/((e*cot(c + d*x))**(3/2)*(a + b*cot(c + d*x))), x)
```

3.74 $\int \frac{1}{(e\cot(c+dx))^{5/2}(a+b\cot(c+dx))}\,dx$

Optimal. Leaf size=351

$$-\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{5/2}\left(a^2+b^2\right)}+\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{}\right.}{2\sqrt{2}\,de^{5/2}\left(a^2+b^2\right)}$$

```
[Out] -2*b^(7/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/a^(5/2)/(a^
2+b^2)/d/e^(5/2)+2/3/a/d/e/(e*cot(d*x+c))^(3/2)-1/2*(a-b)*arctan(1-2^(1/2)*
(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)/d/e^(5/2)*2^(1/2)+1/2*(a-b)*arctan(
1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)/d/e^(5/2)*2^(1/2)-1/4*(a+
b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)/d/
e^(5/2)*2^(1/2)+1/4*(a+b)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+
c))^(1/2))/(a^2+b^2)/d/e^(5/2)*2^(1/2)-2*b/a^2/d/e^2/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.96, antiderivative size = 351, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3569, 3649, 3654, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,de^{5/2}\left(a^2+b^2\right)}+\frac{(a+b)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{}\right.}{2\sqrt{2}\,de^{5/2}\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(5/2)*(a + b*Cot[c + d*x])),x]
```

```
[Out] (-2*b^(7/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqrt[e])]])/(a^(5
/2)*(a^2 + b^2)*d*e^(5/2)) - ((a - b)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*
x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d*e^(5/2)) + ((a - b)*ArcTan[1 + (Sqrt[
2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)*d*e^(5/2)) + 2/(3*a
*d*e*(e*Cot[c + d*x])^(3/2)) - (2*b)/(a^2*d*e^2*Sqrt[e*Cot[c + d*x]]) - ((a
 + b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(
2*Sqrt[2]*(a^2 + b^2)*d*e^(5/2)) + ((a + b)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d
*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)*d*e^(5/2))
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
```

```
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3654

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (C_.)*tan[(e_.)
+ (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbol] :> Dis
t[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n*Simp[a*(A - C) - (A*b - b*C)*Ta
n[e + f*x], x], x], x] + Dist[(A*b^2 + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[
e + f*x])^n*(1 + Tan[e + f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a,
 b, c, d, e, f, A, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && N
eQ[c^2 + d^2, 0] &&  !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{5/2}(a+b\cot(c+dx))}\,dx = \frac{2}{3ade(e\cot(c+dx))^{3/2}} + \frac{2\int \frac{-\frac{3be^2}{2}-\frac{3}{2}ae^2\cot(c+dx)-\frac{3}{2}be^2\cot^2(c+dx)}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))}\,dx}{3ae^3}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2b}{a^2de^2\sqrt{e\cot(c+dx)}} + \frac{4\int \frac{-\frac{3}{4}\left(a^2-b^2\right)e^4+\frac{3}{4}b^2e^4 \cdots}{\sqrt{e\cot(c+dx)}\,(a+b\cdots}}{3a^2e^6}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2b}{a^2de^2\sqrt{e\cot(c+dx)}} + \frac{4\int \frac{-\frac{3}{4}a^3e^4+\frac{3}{4}a^2be^4\cot(\cdots}{\sqrt{e\cot(c+dx)}}}{3a^2\left(a^2+b^2\right)e\cdots}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2b}{a^2de^2\sqrt{e\cot(c+dx)}} + \frac{8\,\mathrm{Subst}\left(\int \frac{\frac{3a^3e^5}{4}-\frac{3}{4}a^2\cdots}{e^2+x^4}\cdots\right.}{3a^2\left(\cdots\right.}$$

$$= \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2b}{a^2de^2\sqrt{e\cot(c+dx)}} - \frac{\left(2b^4\right)\mathrm{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\cdots\right.}{a^2\left(a^2\cdots\right.}$$

$$= -\frac{2b^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{a^{5/2}\left(a^2+b^2\right)de^{5/2}} + \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2b}{a^2de^2\sqrt{e\cot\cdots}}$$

$$= -\frac{2b^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{a^{5/2}\left(a^2+b^2\right)de^{5/2}} + \frac{2}{3ade(e\cot(c+dx))^{3/2}} - \frac{2b}{a^2de^2\sqrt{e\cot\cdots}}$$

$$= -\frac{2b^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{a^{5/2}\left(a^2+b^2\right)de^{5/2}} - \frac{(a-b)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+dx)}}{\sqrt{e}}\right)}{\sqrt{2}\left(a^2+b^2\right)de^{5/2}} + \cdots$$

Mathematica [C] time = 0.28, size = 109, normalized size = 0.31

$$\frac{2\left(b^2\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-\frac{b\cot(c+dx)}{a}\right)+a\left(a\,{}_2F_1\left(-\frac{3}{4},1;\frac{1}{4};-\cot^2(c+dx)\right)-3b\cot(c+dx)\,{}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c+dx\right.\right.}{3ade\left(a^2+b^2\right)(e\cot(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(5/2)*(a + b*Cot[c + d*x])),x]
```

```
[Out] (2*(b^2*Hypergeometric2F1[-3/2, 1, -1/2, -((b*Cot[c + d*x])/a)] + a*(a*Hype
rgeometric2F1[-3/4, 1, 1/4, -Cot[c + d*x]^2] - 3*b*Cot[c + d*x]*Hypergeomet
ric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2])))/(3*a*(a^2 + b^2)*d*e*(e*Cot[c + d*
x])^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(b\cot(dx+c)+a)(e\cot(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)*(e*cot(d*x + c))^(5/2)), x)
```

maple [A] time = 0.63, size = 481, normalized size = 1.37

$$-\frac{2b^4\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{d\,e^2a^2\left(a^2+b^2\right)\sqrt{aeb}}+\frac{a\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\ln\left(\frac{e\cot(dx+c)+\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}{e\cot(dx+c)-\left(e^2\right)^{\frac{1}{4}}\sqrt{e\cot(dx+c)}\,\sqrt{2}+\sqrt{e^2}}\right)}{4d\,e^3\left(a^2+b^2\right)}+\frac{a\left(e^2\right)^{\frac{1}{4}}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{e\cot(dx+}}{\left(e^2\right)^{\frac{1}{4}}}\right.}{2d\,e^3\left(a^2+b^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x)
```

```
[Out] -2/d/e^2/a^2*b^4/(a^2+b^2)/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e
*b)^(1/2))+1/4/d/e^3/(a^2+b^2)*a*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/2/d/e^3/(a^2+b^2)*a*(e^2)^(1/4
)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/2/d/e^3/(a^2
+b^2)*a*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)+1)-1/4/d/e^2/(a^2+b^2)*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)
*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/2/d/e^2/(a^2+b^2)*b/(e^2)^(1/4)*2^(1
/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d/e^2/(a^2+b^2)*
b/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+2
/3/a/d/e/(e*cot(d*x+c))^(3/2)-2*b/a^2/d/e^2/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.66, size = 280, normalized size = 0.80

$$-\frac{e\left(\frac{24\,b^{4}\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{4}+a^{2}b^{2}\right)\sqrt{abe}\,e^{3}}-\frac{3\left(\frac{2\sqrt{2}\,(a-b)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\,(a-b)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}-2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{\sqrt{2}\,(a+b)\log\left(\sqrt{2}\sqrt{e}\sqrt{\cdots}\right.}{\cdots}\cdots\right)}{\left(a^{2}+b^{2}\right)e^{3}}\cdots\right)}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/12*e*(24*b^4*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a^4 + a^2*b^2)
*sqrt(a*b*e)*e^3) - 3*(2*sqrt(2)*(a - b)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e
) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a - b)*arctan(-1/
2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqr
t(2)*(a + b)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))
/sqrt(e) - sqrt(2)*(a + b)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e +
e/tan(d*x + c))/sqrt(e))/((a^2 + b^2)*e^3) - 8*(a*e - 3*b*e/tan(d*x + c))/(
a^2*e^3*(e/tan(d*x + c))^(3/2)))/d
```

mupad [B] time = 2.81, size = 6042, normalized size = 17.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(5/2)*(a + b*cot(c + d*x))),x)
```

```
[Out] (2/(3*a*e) - (2*b*cot(c + d*x))/(a^2*e))/(d*(e*cot(c + d*x))^(3/2)) - atan(
((((e*cot(c + d*x))^(1/2)*(64*a^14*b^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18))/2
+ ((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)*(((((1/(b^2*
d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)*(((e*cot(c + d*x))^(1/2
)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)*(512*a^18*b^9
*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28 - 512*a^24*b^3*d^
9*e^28))/4 - 256*a^16*b^10*d^8*e^26 - 256*a^18*b^8*d^8*e^26 + 192*a^20*b^6*
d^8*e^26 + 128*a^22*b^4*d^8*e^26 - 64*a^24*b^2*d^8*e^26))/2 - ((e*cot(c + d
*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 128*a^21*b^4*d
^7*e^23 - 64*a^23*b^2*d^7*e^23))/2)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2
*a*b*d^2*e^5))^(1/2))/2 + 192*a^15*b^9*d^6*e^21 - 16*a^19*b^5*d^6*e^21 - 16
*a^21*b^3*d^6*e^21))/2)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5
))^(1/2)*1i + (((e*cot(c + d*x))^(1/2)*(64*a^14*b^9*d^5*e^18 + 32*a^18*b^5*
d^5*e^18))/2 + ((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)
*(((((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)*(((e*cot(c
 + d*x))^(1/2)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)*
(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28 - 51
2*a^24*b^3*d^9*e^28))/4 + 256*a^16*b^10*d^8*e^26 + 256*a^18*b^8*d^8*e^26 -
192*a^20*b^6*d^8*e^26 - 128*a^22*b^4*d^8*e^26 + 64*a^24*b^2*d^8*e^26))/2 -
((e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 1
28*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23))/2)*(1/(b^2*d^2*e^5*1i - a^2*d
^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2))/2 - 192*a^15*b^9*d^6*e^21 + 16*a^19*b^5*
d^6*e^21 + 16*a^21*b^3*d^6*e^21))/2)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i +
2*a*b*d^2*e^5))^(1/2)*1i)/((((e*cot(c + d*x))^(1/2)*(64*a^14*b^9*d^5*e^18 +
 32*a^18*b^5*d^5*e^18))/2 + ((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^
2*e^5))^(1/2)*(((((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/
2)*(((e*cot(c + d*x))^(1/2)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2
*e^5))^(1/2)*(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*
d^9*e^28 - 512*a^24*b^3*d^9*e^28))/4 + 256*a^16*b^10*d^8*e^26 + 256*a^18*b^
8*d^8*e^26 - 192*a^20*b^6*d^8*e^26 - 128*a^22*b^4*d^8*e^26 + 64*a^24*b^2*d^
8*e^26))/2 - ((e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6
*d^7*e^23 - 128*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23))/2)*(1/(b^2*d^2*e
^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2))/2 - 192*a^15*b^9*d^6*e^21 +
 16*a^19*b^5*d^6*e^21 + 16*a^21*b^3*d^6*e^21))/2)*(1/(b^2*d^2*e^5*1i - a^2*
d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2) - (((e*cot(c + d*x))^(1/2)*(64*a^14*b^9*
d^5*e^18 + 32*a^18*b^5*d^5*e^18))/2 + ((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i
+ 2*a*b*d^2*e^5))^(1/2)*(((((1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2
*e^5))^(1/2)*(((e*cot(c + d*x))^(1/2)*(1/(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i +
 2*a*b*d^2*e^5))^(1/2)*(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512
*a^22*b^5*d^9*e^28 - 512*a^24*b^3*d^9*e^28))/4 - 256*a^16*b^10*d^8*e^26 - 2
56*a^18*b^8*d^8*e^26 + 192*a^20*b^6*d^8*e^26 + 128*a^22*b^4*d^8*e^26 - 64*a
^24*b^2*d^8*e^26))/2 - ((e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 44
8*a^19*b^6*d^7*e^23 - 128*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23))/2)*(1/
```

(b^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2))/2 + 192*a^15*b^9*
d^6*e^21 - 16*a^19*b^5*d^6*e^21 - 16*a^21*b^3*d^6*e^21))/2)*(1/(b^2*d^2*e^5
*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2) + 64*a^14*b^8*d^4*e^16))*(1/(b
^2*d^2*e^5*1i - a^2*d^2*e^5*1i + 2*a*b*d^2*e^5))^(1/2)*1i - atan(((1i/(4*(b
^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*
(64*a^14*b^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18) + (1i/(4*(b^2*d^2*e^5 - a^2*d
^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d
^2*e^5*2i)))^(1/2)*((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(
1/2)*((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*(e*cot(c
+ d*x))^(1/2)*(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5
*d^9*e^28 - 512*a^24*b^3*d^9*e^28) - 512*a^16*b^10*d^8*e^26 - 512*a^18*b^8*
d^8*e^26 + 384*a^20*b^6*d^8*e^26 + 256*a^22*b^4*d^8*e^26 - 128*a^24*b^2*d^8
*e^26) - (e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*
e^23 - 128*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23)) + 384*a^15*b^9*d^6*e^
21 - 32*a^19*b^5*d^6*e^21 - 32*a^21*b^3*d^6*e^21))*1i + (1i/(4*(b^2*d^2*e^5
 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(64*a^14*b
^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18) + (1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a
*b*d^2*e^5*2i)))^(1/2)*((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)
))^(1/2)*((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((1i/
(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*(e*cot(c + d*x))^(1
/2)*(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28
- 512*a^24*b^3*d^9*e^28) + 512*a^16*b^10*d^8*e^26 + 512*a^18*b^8*d^8*e^26 -
 384*a^20*b^6*d^8*e^26 - 256*a^22*b^4*d^8*e^26 + 128*a^24*b^2*d^8*e^26) - (
e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 128
*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23)) - 384*a^15*b^9*d^6*e^21 + 32*a^
19*b^5*d^6*e^21 + 32*a^21*b^3*d^6*e^21))*1i)/((1i/(4*(b^2*d^2*e^5 - a^2*d^2
*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(64*a^14*b^9*d^5*e^1
8 + 32*a^18*b^5*d^5*e^18) + (1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5
2i)))^(1/2)((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*(
(1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((1i/(4*(b^2*d^
2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a
^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28 - 512*a^24
*b^3*d^9*e^28) + 512*a^16*b^10*d^8*e^26 + 512*a^18*b^8*d^8*e^26 - 384*a^20*
b^6*d^8*e^26 - 256*a^22*b^4*d^8*e^26 + 128*a^24*b^2*d^8*e^26) - (e*cot(c +
d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 128*a^21*b^4*
d^7*e^23 - 64*a^23*b^2*d^7*e^23)) - 384*a^15*b^9*d^6*e^21 + 32*a^19*b^5*d^6
*e^21 + 32*a^21*b^3*d^6*e^21)) - (1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^
2*e^5*2i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(64*a^14*b^9*d^5*e^18 + 32*a^18*b
^5*d^5*e^18) + (1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*
((1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((1i/(4*(b^2*d
^2*e^5 - a^2*d^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*((1i/(4*(b^2*d^2*e^5 - a^2*d
^2*e^5 + a*b*d^2*e^5*2i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^18*b^9*d^9*e
^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28 - 512*a^24*b^3*d^9*e^28
) - 512*a^16*b^10*d^8*e^26 - 512*a^18*b^8*d^8*e^26 + 384*a^20*b^6*d^8*e^26
+ 256*a^22*b^4*d^8*e^26 - 128*a^24*b^2*d^8*e^26) - (e*cot(c + d*x))^(1/2)*(

```
512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 128*a^21*b^4*d^7*e^23 - 64
*a^23*b^2*d^7*e^23)) + 384*a^15*b^9*d^6*e^21 - 32*a^19*b^5*d^6*e^21 - 32*a^
21*b^3*d^6*e^21)) + 64*a^14*b^8*d^4*e^16))*(1i/(4*(b^2*d^2*e^5 - a^2*d^2*e^
5 + a*b*d^2*e^5*2i)))^(1/2)*2i - (atan(((((e*cot(c + d*x))^(1/2)*(64*a^14*b
^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18) - ((-a^5*b^7*e^5)^(1/2)*(32*a^19*b^5*d^
6*e^21 - 384*a^15*b^9*d^6*e^21 + 32*a^21*b^3*d^6*e^21 + (((e*cot(c + d*x))^
(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 128*a^21*b^4*d^7*e^
23 - 64*a^23*b^2*d^7*e^23) + ((-a^5*b^7*e^5)^(1/2)*(512*a^16*b^10*d^8*e^26
+ 512*a^18*b^8*d^8*e^26 - 384*a^20*b^6*d^8*e^26 - 256*a^22*b^4*d^8*e^26 + 1
28*a^24*b^2*d^8*e^26 - ((e*cot(c + d*x))^(1/2)*(-a^5*b^7*e^5)^(1/2)*(512*a^
18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28 - 512*a^24*
b^3*d^9*e^28))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a^2 + b^2)))*(-a^5*b^7
*e^5)^(1/2))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a^2 + b^2)))*(-a^5*b^7*e
^5)^(1/2)*1i)/(a^5*d*e^5*(a^2 + b^2)) + (((e*cot(c + d*x))^(1/2)*(64*a^14*b
^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18) - ((-a^5*b^7*e^5)^(1/2)*(384*a^15*b^9*d
^6*e^21 - 32*a^19*b^5*d^6*e^21 - 32*a^21*b^3*d^6*e^21 + (((e*cot(c + d*x))^
(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 - 128*a^21*b^4*d^7*e^
23 - 64*a^23*b^2*d^7*e^23) - ((-a^5*b^7*e^5)^(1/2)*(512*a^16*b^10*d^8*e^26
+ 512*a^18*b^8*d^8*e^26 - 384*a^20*b^6*d^8*e^26 - 256*a^22*b^4*d^8*e^26 + 1
28*a^24*b^2*d^8*e^26 + ((e*cot(c + d*x))^(1/2)*(-a^5*b^7*e^5)^(1/2)*(512*a^
18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*d^9*e^28 - 512*a^24*
b^3*d^9*e^28))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a^2 + b^2)))*(-a^5*b^7
*e^5)^(1/2))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a^2 + b^2)))*(-a^5*b^7*e
^5)^(1/2)*1i)/(a^5*d*e^5*(a^2 + b^2))))/(64*a^14*b^8*d^4*e^16 - (((e*cot(c +
 d*x))^(1/2)*(64*a^14*b^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18) - ((-a^5*b^7*e^5
)^(1/2)*(32*a^19*b^5*d^6*e^21 - 384*a^15*b^9*d^6*e^21 + 32*a^21*b^3*d^6*e^2
1 + (((e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^2
3 - 128*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23) + ((-a^5*b^7*e^5)^(1/2)*(
512*a^16*b^10*d^8*e^26 + 512*a^18*b^8*d^8*e^26 - 384*a^20*b^6*d^8*e^26 - 25
6*a^22*b^4*d^8*e^26 + 128*a^24*b^2*d^8*e^26 - ((e*cot(c + d*x))^(1/2)*(-a^5
*b^7*e^5)^(1/2)*(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b
^5*d^9*e^28 - 512*a^24*b^3*d^9*e^28))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*
(a^2 + b^2)))*(-a^5*b^7*e^5)^(1/2))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a
^2 + b^2)))*(-a^5*b^7*e^5)^(1/2))/(a^5*d*e^5*(a^2 + b^2)) + (((e*cot(c + d*
x))^(1/2)*(64*a^14*b^9*d^5*e^18 + 32*a^18*b^5*d^5*e^18) - ((-a^5*b^7*e^5)^(
1/2)*(384*a^15*b^9*d^6*e^21 - 32*a^19*b^5*d^6*e^21 - 32*a^21*b^3*d^6*e^21 +
 (((e*cot(c + d*x))^(1/2)*(512*a^15*b^10*d^7*e^23 + 448*a^19*b^6*d^7*e^23 -
 128*a^21*b^4*d^7*e^23 - 64*a^23*b^2*d^7*e^23) - ((-a^5*b^7*e^5)^(1/2)*(512
*a^16*b^10*d^8*e^26 + 512*a^18*b^8*d^8*e^26 - 384*a^20*b^6*d^8*e^26 - 256*a
^22*b^4*d^8*e^26 + 128*a^24*b^2*d^8*e^26 + ((e*cot(c + d*x))^(1/2)*(-a^5*b^
7*e^5)^(1/2)*(512*a^18*b^9*d^9*e^28 + 512*a^20*b^7*d^9*e^28 - 512*a^22*b^5*
d^9*e^28 - 512*a^24*b^3*d^9*e^28))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a^
2 + b^2)))*(-a^5*b^7*e^5)^(1/2))/(a^5*d*e^5*(a^2 + b^2))))/(a^5*d*e^5*(a^2
+ b^2)))*(-a^5*b^7*e^5)^(1/2))/(a^5*d*e^5*(a^2 + b^2))))*(-a^5*b^7*e^5)^(1/
2)*2i)/(a^5*d*e^5*(a^2 + b^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cot(c+dx))^{\frac{5}{2}}(a+b\cot(c+dx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(5/2)/(a+b*cot(d*x+c)),x)
[Out] Integral(1/((e*cot(c + d*x))**(5/2)*(a + b*cot(c + d*x))), x)
```

3.75 $\int \frac{(e\cot(c+dx))^{7/2}}{(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=437

$$\frac{e^{7/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)^2}-\frac{e^{7/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\right.}{2\sqrt{2}d\left(a^2+b^2\right)^2}$$

```
[Out] a^(5/2)*(3*a^2+7*b^2)*e^(7/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e
^(1/2))/b^(5/2)/(a^2+b^2)^2/d+a^2*e^2*(e*cot(d*x+c))^(3/2)/b/(a^2+b^2)/d/(a
+b*cot(d*x+c))+1/2*(a^2-2*a*b-b^2)*e^(7/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^
(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)-1/2*(a^2-2*a*b-b^2)*e^(7/2)*arctan(1+2
^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)+1/4*(a^2+2*a*b-b
^2)*e^(7/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^
2+b^2)^2/d*2^(1/2)-1/4*(a^2+2*a*b-b^2)*e^(7/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2
)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^2/d*2^(1/2)-(3*a^2+2*b^2)*e^3*(e*
cot(d*x+c))^(1/2)/b^2/(a^2+b^2)/d
```

Rubi [A] time = 1.11, antiderivative size = 437, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3565, 3647, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{e^3\left(3a^2+2b^2\right)\sqrt{e\cot(c+dx)}}{b^2d\left(a^2+b^2\right)}+\frac{a^2e^2(e\cot(c+dx))^{3/2}}{bd\left(a^2+b^2\right)(a+b\cot(c+dx))}+\frac{e^{7/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\right.}{2\sqrt{2}d\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(7/2)/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] (a^(5/2)*(3*a^2 + 7*b^2)*e^(7/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqr
t[a]*Sqrt[e])])/(b^(5/2)*(a^2 + b^2)^2*d) + ((a^2 - 2*a*b - b^2)*e^(7/2)*Ar
cTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d)
 - ((a^2 - 2*a*b - b^2)*e^(7/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/S
qrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d) - ((3*a^2 + 2*b^2)*e^3*Sqrt[e*Cot[c + d*
x]])/(b^2*(a^2 + b^2)*d) + (a^2*e^2*(e*Cot[c + d*x])^(3/2))/(b*(a^2 + b^2)*
d*(a + b*Cot[c + d*x])) + ((a^2 + 2*a*b - b^2)*e^(7/2)*Log[Sqrt[e] + Sqrt[e
]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d)
 - ((a^2 + 2*a*b - b^2)*e^(7/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2
]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3647

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.
) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a + b*Tan[e + f*x])^m*(c + d*Tan[
e + f*x])^(n + 1))/(d*f*(m + n + 1)), x] + Dist[1/(d*(m + n + 1)), Int[(a +
 b*Tan[e + f*x])^(m - 1)*(c + d*Tan[e + f*x])^n*Simp[a*A*d*(m + n + 1) - C*
(b*c*m + a*d*(n + 1)) + d*(A*b + a*B - b*C)*(m + n + 1)*Tan[e + f*x] - (C*m
*(b*c - a*d) - b*B*d*(m + n + 1))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b
, c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] &&
```

```
NeQ[c^2 + d^2, 0] && GtQ[m, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[c
, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{7/2}}{(a+b\cot(c+dx))^2}\,dx = \frac{a^2e^2(e\cot(c+dx))^{3/2}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{\sqrt{e\cot(c+dx)}\left(-\frac{3}{2}a^2e^3+abe^3\cot(c+dx)-\frac{1}{2}\left(3a^2+2b^2\right)e^3\cot^2(c+\cdots}{a+b\cot(c+dx)}}{b\left(a^2+b^2\right)}$$

$$= -\frac{\left(3a^2+2b^2\right)e^3\sqrt{e\cot(c+dx)}}{b^2\left(a^2+b^2\right)d} + \frac{a^2e^2(e\cot(c+dx))^{3/2}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{2\int \frac{-\frac{1}{4}a\left(3a^2+2b^2\cdots}{\cdots}}{\cdots}$$

$$= -\frac{\left(3a^2+2b^2\right)e^3\sqrt{e\cot(c+dx)}}{b^2\left(a^2+b^2\right)d} + \frac{a^2e^2(e\cot(c+dx))^{3/2}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{2\int \frac{\frac{1}{2}b^2\left(a^2-b^2\right)e^4\cdots}{\sqrt{e\cot\cdots}}}{b^2\left(a^2\cdots\right.}$$

$$= -\frac{\left(3a^2+2b^2\right)e^3\sqrt{e\cot(c+dx)}}{b^2\left(a^2+b^2\right)d} + \frac{a^2e^2(e\cot(c+dx))^{3/2}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{4\,\mathrm{Subst}\left(\int \frac{-\frac{1}{2}b\cdots}{\cdots}\right.}{\cdots}$$

$$= -\frac{\left(3a^2+2b^2\right)e^3\sqrt{e\cot(c+dx)}}{b^2\left(a^2+b^2\right)d} + \frac{a^2e^2(e\cot(c+dx))^{3/2}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{\left(a^3\left(3a^2+7b^2\right)\cdots\right.}{\cdots}$$

$$= \frac{a^{5/2}\left(3a^2+7b^2\right)e^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{5/2}\left(a^2+b^2\right)^2 d} - \frac{\left(3a^2+2b^2\right)e^3\sqrt{e\cot(c+dx)}}{b^2\left(a^2+b^2\right)d} + \frac{a\cdots}{b\left(a^2\cdots\right.}$$

$$= \frac{a^{5/2}\left(3a^2+7b^2\right)e^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{5/2}\left(a^2+b^2\right)^2 d} - \frac{\left(3a^2+2b^2\right)e^3\sqrt{e\cot(c+dx)}}{b^2\left(a^2+b^2\right)d} + \frac{a\cdots}{b\left(a^2\cdots\right.}$$

$$= \frac{a^{5/2}\left(3a^2+7b^2\right)e^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{5/2}\left(a^2+b^2\right)^2 d} + \frac{\left(a^2-2ab-b^2\right)e^{7/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot\cdots}}{\sqrt{e}\cdots}\right.}{\sqrt{2}\left(a^2+b^2\right)^2 d}$$

Mathematica [C] time = 6.16, size = 445, normalized size = 1.02

$$-\frac{(e\cot(c+dx))^{7/2}\left(\frac{2b^2\cot^{\frac{9}{2}}(c+dx)\,{}_2F_1\left(2,\frac{9}{2};\frac{11}{2};-\frac{b\cot(c+dx)}{a}\right)}{9a^2(a^2+b^2)}+\frac{4ab\left(-7\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-3\cot^{\frac{7}{2}}(c+dx)+7\cot^{\frac{3}{2}}(c+dx)\right)}{21(a^2+b^2)^2}+\cdots\right)}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(7/2)/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -(((e*Cot[c + d*x])^(7/2)*((4*a*b*Cot[c + d*x]^(7/2))/(7*(a^2 + b^2)^2) - (
4*a^2*(3*Cot[c + d*x]^(5/2) - 5*a*((-3*a*(-((Sqrt[a]*ArcTan[(Sqrt[b]*Sqrt[C
ot[c + d*x]])/Sqrt[a]])/b^(3/2)) + Sqrt[Cot[c + d*x]]/b))/b + Cot[c + d*x]^
(3/2)/b)))/(15*(a^2 + b^2)^2) + (4*a*b*(7*Cot[c + d*x]^(3/2) - 3*Cot[c + d*
x]^(7/2) - 7*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x
]^2]))/(21*(a^2 + b^2)^2) + (2*b^2*Cot[c + d*x]^(9/2)*Hypergeometric2F1[2,
9/2, 11/2, -((b*Cot[c + d*x])/a)])/(9*a^2*(a^2 + b^2)) - ((a - b)*(a + b)*(
40*Sqrt[Cot[c + d*x]] - 8*Cot[c + d*x]^(5/2) + (5*(4*(Sqrt[2]*ArcTan[1 - Sq
rt[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]])
 + 2*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - 2*Sqrt[2]
*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/2))/(20*(a^2 + b^2)^2
)))/(d*Cot[c + d*x]^(7/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{7}{2}}}{(b\cot(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(7/2)/(b*cot(d*x + c) + a)^2, x)
```

maple [B] time = 0.83, size = 805, normalized size = 1.84

$$-\frac{2e^{3}\sqrt{e\cot\left(dx+c\right)}}{d\,b^{2}}-\frac{e^{4}a^{5}\sqrt{e\cot\left(dx+c\right)}}{d\left(a^{2}+b^{2}\right)^{2}b^{2}\left(e\cot\left(dx+c\right)b+ae\right)}-\frac{e^{4}a^{3}\sqrt{e\cot\left(dx+c\right)}}{d\left(a^{2}+b^{2}\right)^{2}\left(e\cot\left(dx+c\right)b+ae\right)}+\frac{3e^{4}a^{5}\arctan\left(\right.}{d\left(a^{2}+b^{2}\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^2,x)
```

```
[Out] -2/d*e^3/b^2*(e*cot(d*x+c))^(1/2)-1/d*e^4*a^5/(a^2+b^2)^2/b^2*(e*cot(d*x+c)
)^(1/2)/(e*cot(d*x+c)*b+a*e)-1/d*e^4*a^3/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(
e*cot(d*x+c)*b+a*e)+3/d*e^4*a^5/(a^2+b^2)^2/b^2/(a*e*b)^(1/2)*arctan((e*cot
(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+7/d*e^4*a^3/(a^2+b^2)^2/(a*e*b)^(1/2)*arcta
n((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+1/2/d*e^3/(a^2+b^2)^2*(e^2)^(1/4)*2
^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2/d*e^3/(a
^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)+1)*b^2-1/4/d*e^3/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2+1/4/d*e^3/(a^2+b^2)^2*(e^2)^
(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
)))*b^2-1/2/d*e^3/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2/d*e^3/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arc
tan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/2/d*e^4/(a^2+b^2)^2*a
*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^
(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(
e^2)^(1/2)))+1/d*e^4/(a^2+b^2)^2*a*b/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*e^4/(a^2+b^2)^2*a*b/(e^2)^(1/4)*2^(1/2
)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.46, size = 385, normalized size = 0.88

$$-\frac{\left(\frac{4\,a^3e^3\sqrt{\frac{e}{\tan(dx+c)}}}{\left(a^3b^2+ab^4\right)e+\frac{\left(a^2b^3+b^5\right)e}{\tan(dx+c)}} - \frac{4\left(3\,a^5+7\,a^3b^2\right)e^3\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^4b^2+2\,a^2b^4+b^6\right)\sqrt{abe}} + \frac{\left(\frac{2\,\sqrt{2}\left(a^2-2\,ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^2-2\,ab-b^2\right)\arctan\cdots}{\cdots}\right.}{\cdots}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/4*(4*a^3*e^3*sqrt(e/tan(d*x + c))/((a^3*b^2 + a*b^4)*e + (a^2*b^3 + b^5)
*e/tan(d*x + c)) - 4*(3*a^5 + 7*a^3*b^2)*e^3*arctan(b*sqrt(e/tan(d*x + c))/
sqrt(a*b*e))/((a^4*b^2 + 2*a^2*b^4 + b^6)*sqrt(a*b*e)) + (2*sqrt(2)*(a^2 -
2*a*b - b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/
sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(
2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^2 + 2*a*
b - b^2)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqr
t(e) - sqrt(2)*(a^2 + 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)
) + e + e/tan(d*x + c))/sqrt(e))*e^3/(a^4 + 2*a^2*b^2 + b^4) + 8*e^2*sqrt(e
/tan(d*x + c))/b^2)*e/d
```

mupad [B] time = 3.97, size = 13244, normalized size = 30.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(7/2)/(a + b*cot(c + d*x))^2,x)
```

```
[Out] (atan(((((16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10
*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^2
4))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4
) + (((16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 +
 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^1
1*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (((1
6*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*
b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*
```

d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4) + (((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (8*(e*cot(c + d*x))^(1/2)*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/((b^9*d + 2*a^2*b^7*d + a^4*b^5*d)*(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2)*1i)/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)) + (((16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4) - (((16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) + (((16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4) - (((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) + (8*(e*cot(c + d*x))^(1/2)*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/((b^9*d + 2*a^2*b^7*d + a^4*b^5*d)*(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2)*1i)/(2*(b^9*d + 2*a^2*b^7*d + a^4*b^5*d)))/((32*(7*a^3*b^7*e^28 + 3*a^5*b^5*e^28))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (((16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4) + (((16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (((16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b

^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3
*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8
*b^3*d^4) + (((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*
d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*
e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4
*a^6*b^5*d^5 + a^8*b^3*d^5) - (8*(e*cot(c + d*x))^(1/2)*(3*a^2 + 7*b^2)*(-a
^5*b^5*e^7)^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*
d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^
4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/((b^9*d + 2*a^2*b^7
*d + a^4*b^5*d)*(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 +
a^8*b^3*d^4)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7
*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b
^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2
*b^7*d + a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a
^2*b^7*d + a^4*b^5*d)) + (((16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12
*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24
+ 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5
*d^4 + a^8*b^3*d^4) - (((16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 -
18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b
^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a
^8*b^3*d^5) + (((16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*
d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^
17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17
))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4)
- (((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14
+ 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56
*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*
d^5 + a^8*b^3*d^5) + (8*(e*cot(c + d*x))^(1/2)*(3*a^2 + 7*b^2)*(-a^5*b^5*e^
7)^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10
+ 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 -
160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/((b^9*d + 2*a^2*b^7*d + a^4*
b^5*d)*(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*
d^4)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^4*
b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d + a^
4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d +
a^4*b^5*d)))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2))/(2*(b^9*d + 2*a^2*b^7*d
+ a^4*b^5*d))))*(3*a^2 + 7*b^2)*(-a^5*b^5*e^7)^(1/2)*1i)/(b^9*d + 2*a^2*b^7
*d + a^4*b^5*d) - atan((((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 +
360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288
*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a
^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (16*(e*cot(c + d*x))^(1/2)*(-e^
7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)
))^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10
+ 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 -
160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 +

6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*1i - (((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*1i)/((32*(7*a^3*b^7*e^28 + 3*a^5*b^5*e^28))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) + (((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (16*(e*cot(c + d*x))^(1/2)*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 1

60*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160
*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a
^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1
i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*
x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 +
72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132
*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*
a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*
1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(30*a^6*b^8*
d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21
+ 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5
+ 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-e^7/(4*(a^4*d^2*1i + b^4*
d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c
+ d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^2
4 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2
*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*
1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (((
((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 64
0*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^1
3*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5
+ a^8*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*
1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^20*d^4*e^10
+ 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 1
60*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*
a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d
^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*
b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2
*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 +
448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480
*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*
d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3
*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*
d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21
+ 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*
b^5*d^5 + a^8*b^3*d^5))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4
*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(9*a^12*e
^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*
a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4
+ 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-e^7/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^
3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)))*(-e^7/(4*(a^4*d^2*1i + b^4*
d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*2i - (2*e^3*(e
*cot(c + d*x))^(1/2))/(b^2*d) - atan(((((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b
^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*
d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2
*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (16*(e*cot(c + d*

x))^(1/2)*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*1i - (((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*1i)/((32*(7*a^3*b^7*e^28 + 3*a^5*b^5*e^28))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) + (((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4

```
*e^14 + 288*a^11*b^7*d^4*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^
9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5) - (16*(e*cot(c + d*x))
^(1/2)*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a
^2*b^2*d^2)))^(1/2)*(32*b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^1
6*d^4*e^10 + 160*a^6*b^14*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*
d^4*e^10 - 160*a^12*b^8*d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2
*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4
*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16
*(e*cot(c + d*x))^(1/2)*(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b
^13*d^2*e^17 + 72*a^5*b^11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d
^2*e^17 + 1132*a^11*b^5*d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^
2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^
4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (1
6*(30*a^6*b^8*d^2*e^21 - 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8
*b^6*d^2*e^21 + 388*a^10*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 +
4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-(e^7*1i)/(4
*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)
- (16*(e*cot(c + d*x))^(1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 +
 2*a^4*b^8*e^24 - 49*a^6*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^
11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e
^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)
))^(1/2) + (((((16*(8*a*b^17*d^4*e^14 + 96*a^3*b^15*d^4*e^14 + 360*a^5*b^13
*d^4*e^14 + 640*a^7*b^11*d^4*e^14 + 600*a^9*b^9*d^4*e^14 + 288*a^11*b^7*d^4
*e^14 + 56*a^13*b^5*d^4*e^14))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^7*d^5 +
4*a^6*b^5*d^5 + a^8*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*(-(e^7*1i)/(4*(a^
4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*
b^20*d^4*e^10 + 160*a^2*b^18*d^4*e^10 + 288*a^4*b^16*d^4*e^10 + 160*a^6*b^1
4*d^4*e^10 - 160*a^8*b^12*d^4*e^10 - 288*a^10*b^10*d^4*e^10 - 160*a^12*b^8*
d^4*e^10 - 32*a^14*b^6*d^4*e^10))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^4
 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d
^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*
(72*a^15*b*d^2*e^17 - 60*a*b^15*d^2*e^17 - 52*a^3*b^13*d^2*e^17 + 72*a^5*b^
11*d^2*e^17 + 448*a^7*b^9*d^2*e^17 + 1108*a^9*b^7*d^2*e^17 + 1132*a^11*b^5*
d^2*e^17 + 480*a^13*b^3*d^2*e^17))/(b^11*d^4 + 4*a^2*b^9*d^4 + 6*a^4*b^7*d^
4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*
d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(30*a^6*b^8*d^2*e^21 -
 224*a^4*b^10*d^2*e^21 - 18*a^14*d^2*e^21 + 600*a^8*b^6*d^2*e^21 + 388*a^10
*b^4*d^2*e^21 + 24*a^12*b^2*d^2*e^21))/(b^11*d^5 + 4*a^2*b^9*d^5 + 6*a^4*b^
7*d^5 + 4*a^6*b^5*d^5 + a^8*b^3*d^5))*(-(e^7*1i)/(4*(a^4*d^2 + b^4*d^2 + a*
b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(
1/2)*(9*a^12*e^24 + 2*b^12*e^24 + 4*a^2*b^10*e^24 + 2*a^4*b^8*e^24 - 49*a^6
*b^6*e^24 + 7*a^8*b^4*e^24 + 33*a^10*b^2*e^24))/(b^11*d^4 + 4*a^2*b^9*d^4 +
 6*a^4*b^7*d^4 + 4*a^6*b^5*d^4 + a^8*b^3*d^4))*(-(e^7*1i)/(4*(a^4*d^2 + b^4
*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)))*(-(e^7*1i)/(4
*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*
```

```
2i - (a^3*e^4*(e*cot(c + d*x))^(1/2))/((a^2 + b^2)*(a*b^2*d*e + b^3*d*e*cot
(c + d*x)))
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(7/2)/(a+b*cot(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.76 $\int \frac{(e\cot(c+dx))^{5/2}}{(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=393

$$\frac{e^{5/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}-\frac{e^{5/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{\right.}}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}$$

```
[Out] -a^(3/2)*(a^2+5*b^2)*e^(5/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^
(1/2))/b^(3/2)/(a^2+b^2)^2/d-1/2*(a^2+2*a*b-b^2)*e^(5/2)*arctan(1-2^(1/2)*(
e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)+1/2*(a^2+2*a*b-b^2)*e^(5
/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)+1/
4*(a^2-2*a*b-b^2)*e^(5/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+
c))^(1/2))/(a^2+b^2)^2/d*2^(1/2)-1/4*(a^2-2*a*b-b^2)*e^(5/2)*ln(e^(1/2)+cot
(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^2/d*2^(1/2)+a^2*e^2
*(e*cot(d*x+c))^(1/2)/b/(a^2+b^2)/d/(a+b*cot(d*x+c))
```

Rubi [A] time = 0.74, antiderivative size = 393, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3565, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{a^2e^2\sqrt{e\cot(c+dx)}}{bd\left(a^2+b^2\right)(a+b\cot(c+dx))}+\frac{e^{5/2}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}-\frac{e^{5/2}\left(a^2-2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -((a^(3/2)*(a^2 + 5*b^2)*e^(5/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqr
t[a]*Sqrt[e])])/(b^(3/2)*(a^2 + b^2)^2*d)) - ((a^2 + 2*a*b - b^2)*e^(5/2)*A
rcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d
) + ((a^2 + 2*a*b - b^2)*e^(5/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/
Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d) + (a^2*e^2*Sqrt[e*Cot[c + d*x]])/(b*(a^
2 + b^2)*d*(a + b*Cot[c + d*x])) + ((a^2 - 2*a*b - b^2)*e^(5/2)*Log[Sqrt[e]
 + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 +
b^2)^2*d) - ((a^2 - 2*a*b - b^2)*e^(5/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x]
 + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{5/2}}{(a+b\cot(c+dx))^2}\,dx = \frac{a^2e^2\sqrt{e\cot(c+dx)}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{-\frac{1}{2}a^2e^3+abe^3\cot(c+dx)-\frac{1}{2}\left(a^2+2b^2\right)e^3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{b\left(a^2+b^2\right)}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{2ab^2e^3+b\left(a^2-b^2\right)e^3\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{b\left(a^2+b^2\right)^2} + \frac{\left(a^2\left(a^2+5b^2\right)e^3\right)}{2}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{2\,\mathrm{Subst}\left(\int \frac{-2ab^2e^4-b\left(a^2-b^2\right)e^3x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx}\right.}{b\left(a^2+b^2\right)^2 d}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(a^2\left(a^2+5b^2\right)e^2\right)\mathrm{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c\right.}{b\left(a^2+b^2\right)^2 d}$$

$$= -\frac{a^{3/2}\left(a^2+5b^2\right)e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{3/2}\left(a^2+b^2\right)^2 d} + \frac{a^2e^2\sqrt{e\cot(c+dx)}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{((a}{}$$

$$= -\frac{a^{3/2}\left(a^2+5b^2\right)e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{3/2}\left(a^2+b^2\right)^2 d} + \frac{a^2e^2\sqrt{e\cot(c+dx)}}{b\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{(a^2}{}$$

$$= -\frac{a^{3/2}\left(a^2+5b^2\right)e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{b^{3/2}\left(a^2+b^2\right)^2 d} - \frac{\left(a^2+2ab-b^2\right)e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot}}{\sqrt{}}\right.}{\sqrt{2}\left(a^2+b^2\right)^2 d}$$

Mathematica [C] time = 2.80, size = 390, normalized size = 0.99

$$-\frac{(e\cot(c+dx))^{5/2}\left(12b^{7/2}\left(a^2+b^2\right)\cot^{\frac{7}{2}}(c+dx)\,{}_2F_1\left(2,\frac{7}{2};\frac{9}{2};-\frac{b\cot(c+dx)}{a}\right)-28a^2b^{3/2}\left(a^2-b^2\right)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -1/42*((e*Cot[c + d*x])^(5/2)*(-28*a^2*b^(3/2)*(a^2 - b^2)*Cot[c + d*x]^(3/
2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2] + 12*b^(7/2)*(a^2 + b^2)
```

```
*Cot[c + d*x]^(7/2)*Hypergeometric2F1[2, 7/2, 9/2, -((b*Cot[c + d*x])/a)] -
 7*a^2*(-6*Sqrt[2]*a*b^(5/2)*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] + 6*Sqr
t[2]*a*b^(5/2)*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + 24*a^(7/2)*ArcTan[(
Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]] - 24*a^3*Sqrt[b]*Sqrt[Cot[c + d*x]] -
24*a*b^(5/2)*Sqrt[Cot[c + d*x]] + 4*a^2*b^(3/2)*Cot[c + d*x]^(3/2) + 4*b^(7
/2)*Cot[c + d*x]^(3/2) - 3*Sqrt[2]*a*b^(5/2)*Log[1 - Sqrt[2]*Sqrt[Cot[c + d
*x]] + Cot[c + d*x]] + 3*Sqrt[2]*a*b^(5/2)*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x
]] + Cot[c + d*x]])))/(a^2*b^(3/2)*(a^2 + b^2)^2*d*Cot[c + d*x]^(5/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{5}{2}}}{(b\cot(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(5/2)/(b*cot(d*x + c) + a)^2, x)
```

maple [B] time = 0.78, size = 784, normalized size = 1.99

$$\frac{e^3a^4\sqrt{e\cot(dx+c)}}{d\left(a^2+b^2\right)^2 b\,(e\cot(dx+c)\,b+ae)}+\frac{e^3a^2b\sqrt{e\cot(dx+c)}}{d\left(a^2+b^2\right)^2(e\cot(dx+c)\,b+ae)}-\frac{e^3a^4\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{d\left(a^2+b^2\right)^2 b\sqrt{aeb}}-\frac{5e^3a^2b\,\mathrm{arcta}}{d\left(a^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^2,x)
```

```
[Out] 1/d*e^3*a^4/(a^2+b^2)^2/b*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)+1/d*e^3
*a^2/(a^2+b^2)^2*b*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)-1/d*e^3*a^4/(a
^2+b^2)^2/b/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-5/d*
e^3*a^2/(a^2+b^2)^2*b/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(
1/2))+1/2/d*e^2/(a^2+b^2)^2*a*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^
```

```
(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d*e^2/(a^2+b^2)^2*a*b*(e^2)^(1/
4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d*e^2/(a^2+
b^2)^2*a*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)+1/4/d*e^3/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2-1/4/d*e^3/(a^2+b^2)^2*2^(1/2)/(
e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^
(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))
*b^2+1/2/d*e^3/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)+1)*a^2-1/2/d*e^3/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan
(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/2/d*e^3/(a^2+b^2)^2*2^(1
/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2
/d*e^3/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)*b^2
```

maxima [**A**] time = 0.45, size = 359, normalized size = 0.91

$$\frac{\left(\frac{4\,a^2e^2\sqrt{\frac{e}{\tan(dx+c)}}}{\left(a^3b+ab^3\right)e+\frac{\left(a^2b^2+b^4\right)e}{\tan(dx+c)}} - \frac{4\left(a^4+5\,a^2b^2\right)e^2\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^4b+2\,a^2b^3+b^5\right)\sqrt{abe}} + \frac{\frac{2\sqrt{2}\left(a^2+2\,ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}} + \frac{2\sqrt{2}\left(a^2+2\,ab-b^2\right)\arctan\left(-\cdots\right.}{\cdots}}{\cdots}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/4*(4*a^2*e^2*sqrt(e/tan(d*x + c))/((a^3*b + a*b^3)*e + (a^2*b^2 + b^4)*e/
tan(d*x + c)) - 4*(a^4 + 5*a^2*b^2)*e^2*arctan(b*sqrt(e/tan(d*x + c))/sqrt(
a*b*e))/((a^4*b + 2*a^2*b^3 + b^5)*sqrt(a*b*e)) + (2*sqrt(2)*(a^2 + 2*a*b -
 b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e)
)/sqrt(e) + 2*sqrt(2)*(a^2 + 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt
(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^2 - 2*a*b - b^2
)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) +
sqrt(2)*(a^2 - 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e +
 e/tan(d*x + c))/sqrt(e))*e^2/(a^4 + 2*a^2*b^2 + b^4))*e/d
```

mupad [**B**] time = 3.12, size = 12617, normalized size = 32.10

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)/(a + b*cot(c + d*x))^2,x)
```

```
[Out] atan((((((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d
^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^
13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5)
- (16*(e*cot(c + d*x))^(1/2)*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i
 - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d
^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*
e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10
))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(
(e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^
2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*
e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 +
 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^
2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2
 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (8*(4*a*b^11*d^2*
e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 3
20*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b
^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 +
a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))
^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6
*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b
^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a
^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*1i - (((((8*(96*a^2*b^14*d^4*e^13 + 48
0*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^
10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d
^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*((e^5*1i)/
(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2
)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a
^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12
*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4
 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*
d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)
*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b
^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^
2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d
^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*
b^2*d^2)))^(1/2) + (8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9
*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e
^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5)
)*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2
*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2
*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 +
```

a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(
a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*1i
)/((16*(a^8*e^23 + 10*a^2*b^6*e^23 + 27*a^4*b^4*e^23 + 10*a^6*b^2*e^23))/(b
^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) + (((((
8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 9
60*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d
^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) - (16*(e*co
t(c + d*x))^(1/2)*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^
2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 2
88*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 288*
a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/(b^9*d^4
 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4
*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)
+ (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a
^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^
5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 +
 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^
2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (8*(4*a*b^11*d^2*e^18 + 16*a
^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*
d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*
a^4*b^5*d^5 + 4*a^6*b^3*d^5))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4
i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(a^1
0*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 +
 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*
a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i
 - 6*a^2*b^2*d^2)))^(1/2) + (((((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4
*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^1
3 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5
*d^5 + 4*a^6*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*((e^5*1i)/(4*(a^4*d^2 +
b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^18*d^4
*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^
10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10
- 32*a^14*b^4*d^4*e^10))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d
^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b
*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^
2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 +
424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*
d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)
/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/
2) + (8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 12
0*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5
 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5))*((e^5*1i)/(4
*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)
- (16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27
*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4

*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)))*((e^5*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*2i + atan((((((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) - (16*(e*cot(c + d*x))^(1/2)*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*1i - (((((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^

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4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)
*1i)/((16*(a^8*e^23 + 10*a^2*b^6*e^23 + 27*a^4*b^4*e^23 + 10*a^6*b^2*e^23))
/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) + ((
(((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*e^13
+ 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13))/(b^
9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) - (16*(e
*cot(c + d*x))^(1/2)*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3
*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10
+ 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 2
88*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/(b^9*
d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(
a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/
2) + (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 5
2*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9
*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^
4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*
b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (8*(4*a*b^11*d^2*e^18 + 1
6*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b
^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 +
 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3
*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(
a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^2
0 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 +
 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d
^2 - a^2*b^2*d^2*6i)))^(1/2) + (((((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*
d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*
e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*
b^5*d^5 + 4*a^6*b^3*d^5) + (16*(e*cot(c + d*x))^(1/2)*(e^5/(4*(a^4*d^2*1i +
 b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^18*
d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4
*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^
10 - 32*a^14*b^4*d^4*e^10))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^
5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*
a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(60*a*b^13
*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15
 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b
^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(
4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^
(1/2) + (8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 -
 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*
d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5))*(e^5/(4*(
a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/
2) - (16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 -
 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4
+ 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4))*(e^5/(4*(a^4*d^2*1i + b^4
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*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)))*(e^5/(4*(a^
4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)
*2i + (atan((((a^2 + 5*b^2)*((16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10
*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20
))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4) +
((a^2 + 5*b^2)*((8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^
2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18
))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) +
(((16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a
^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^
5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 +
 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4) + (((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12
*d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4
*e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4
*b^5*d^5 + 4*a^6*b^3*d^5) - (8*(e*cot(c + d*x))^(1/2)*(a^2 + 5*b^2)*(-a^3*b
^3*e^5)^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*
e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^1
0 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/((b^7*d + 2*a^2*b^5*d +
a^4*b^3*d)*(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3
*d^4)))*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b
^3*d)))*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b
^3*d)))*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(-a^3*
b^3*e^5)^(1/2)*1i)/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)) + ((a^2 + 5*b^2)*(
(16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a
^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a
^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4) - ((a^2 + 5*b^2)*((8*(4*a*b^11*
d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18
 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a
^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) - (((16*(e*cot(c + d*x))^(1/2)*
(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^
9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2
*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^
4) - (((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*
e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13)
)/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) + (
8*(e*cot(c + d*x))^(1/2)*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2)*(32*b^18*d^4*e^
10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10
- 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 3
2*a^14*b^4*d^4*e^10))/((b^7*d + 2*a^2*b^5*d + a^4*b^3*d)*(b^9*d^4 + a^8*b*d
^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4)))*(a^2 + 5*b^2)*(-a^3*b
^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(a^2 + 5*b^2)*(-a^3*b
^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(-a^3*b^3*e^5)^(1/2))
/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(-a^3*b^3*e^5)^(1/2)*1i)/(2*(b^7*d
+ 2*a^2*b^5*d + a^4*b^3*d)))/((16*(a^8*e^23 + 10*a^2*b^6*e^23 + 27*a^4*b^4*
e^23 + 10*a^6*b^2*e^23))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d
```

```
^5 + 4*a^6*b^3*d^5) + ((a^2 + 5*b^2)*((16*(e*cot(c + d*x))^(1/2)*(a^10*e^20
 - 2*b^10*e^20 - 4*a^2*b^8*e^20 - 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8
*b^2*e^20))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^
3*d^4) + ((a^2 + 5*b^2)*((8*(4*a*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a
^3*b^9*d^2*e^18 - 120*a^5*b^7*d^2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3
*d^2*e^18))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^
3*d^5) + (((16*(e*cot(c + d*x))^(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^
15 + 52*a^3*b^11*d^2*e^15 + 128*a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 3
80*a^9*b^5*d^2*e^15 + 100*a^11*b^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*
b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4) + (((8*(96*a^2*b^14*d^4*e^13 + 480
*a^4*b^12*d^4*e^13 + 960*a^6*b^10*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^1
0*b^6*d^4*e^13 + 96*a^12*b^4*d^4*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^
5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) - (8*(e*cot(c + d*x))^(1/2)*(a^2 + 5*b^2
)*(-a^3*b^3*e^5)^(1/2)*(32*b^18*d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*
b^14*d^4*e^10 + 160*a^6*b^12*d^4*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^
8*d^4*e^10 - 160*a^12*b^6*d^4*e^10 - 32*a^14*b^4*d^4*e^10))/((b^7*d + 2*a^2
*b^5*d + a^4*b^3*d)*(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 +
4*a^6*b^3*d^4)))*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*
d + a^4*b^3*d)))*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*
d + a^4*b^3*d)))*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)
))*(-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)) - ((a^2 + 5*
b^2)*((16*(e*cot(c + d*x))^(1/2)*(a^10*e^20 - 2*b^10*e^20 - 4*a^2*b^8*e^20
- 27*a^4*b^6*e^20 + 15*a^6*b^4*e^20 + 9*a^8*b^2*e^20))/(b^9*d^4 + a^8*b*d^4
 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4) - ((a^2 + 5*b^2)*((8*(4*a
*b^11*d^2*e^18 + 16*a^11*b*d^2*e^18 - 304*a^3*b^9*d^2*e^18 - 120*a^5*b^7*d^
2*e^18 + 320*a^7*b^5*d^2*e^18 + 148*a^9*b^3*d^2*e^18))/(b^9*d^5 + a^8*b*d^5
 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^5) - (((16*(e*cot(c + d*x))^
(1/2)*(60*a*b^13*d^2*e^15 + 8*a^13*b*d^2*e^15 + 52*a^3*b^11*d^2*e^15 + 128*
a^5*b^9*d^2*e^15 + 424*a^7*b^7*d^2*e^15 + 380*a^9*b^5*d^2*e^15 + 100*a^11*b
^3*d^2*e^15))/(b^9*d^4 + a^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*
b^3*d^4) - (((8*(96*a^2*b^14*d^4*e^13 + 480*a^4*b^12*d^4*e^13 + 960*a^6*b^1
0*d^4*e^13 + 960*a^8*b^8*d^4*e^13 + 480*a^10*b^6*d^4*e^13 + 96*a^12*b^4*d^4
*e^13))/(b^9*d^5 + a^8*b*d^5 + 4*a^2*b^7*d^5 + 6*a^4*b^5*d^5 + 4*a^6*b^3*d^
5) + (8*(e*cot(c + d*x))^(1/2)*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2)*(32*b^18*
d^4*e^10 + 160*a^2*b^16*d^4*e^10 + 288*a^4*b^14*d^4*e^10 + 160*a^6*b^12*d^4
*e^10 - 160*a^8*b^10*d^4*e^10 - 288*a^10*b^8*d^4*e^10 - 160*a^12*b^6*d^4*e^
10 - 32*a^14*b^4*d^4*e^10))/((b^7*d + 2*a^2*b^5*d + a^4*b^3*d)*(b^9*d^4 + a
^8*b*d^4 + 4*a^2*b^7*d^4 + 6*a^4*b^5*d^4 + 4*a^6*b^3*d^4)))*(a^2 + 5*b^2)*(
-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(a^2 + 5*b^2)*(
-a^3*b^3*e^5)^(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(-a^3*b^3*e^5)^
(1/2))/(2*(b^7*d + 2*a^2*b^5*d + a^4*b^3*d)))*(-a^3*b^3*e^5)^(1/2))/(2*(b^7
*d + 2*a^2*b^5*d + a^4*b^3*d))))*(a^2 + 5*b^2)*(-a^3*b^3*e^5)^(1/2)*1i)/(b^
7*d + 2*a^2*b^5*d + a^4*b^3*d) + (a^2*e^3*(e*cot(c + d*x))^(1/2))/(b*(a*d*e
 + b*d*e*cot(c + d*x))*(a^2 + b^2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)/(a+b*cot(d*x+c))**2,x)
[Out] Timed out
```

3.77 $\int \frac{(e\cot(c+dx))^{3/2}}{(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=387

$$-\frac{e^{3/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}+\frac{e^{3/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)\right.}{2\sqrt{2}\,d\left(a^2+b^2\right.}$$

```
[Out] -1/2*(a^2-2*a*b-b^2)*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))
/(a^2+b^2)^2/d*2^(1/2)+1/2*(a^2-2*a*b-b^2)*e^(3/2)*arctan(1+2^(1/2)*(e*cot(
d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)-1/4*(a^2+2*a*b-b^2)*e^(3/2)*ln
(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^2/d*2^(
1/2)+1/4*(a^2+2*a*b-b^2)*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*c
ot(d*x+c))^(1/2))/(a^2+b^2)^2/d*2^(1/2)-(a^2-3*b^2)*e^(3/2)*arctan(b^(1/2)*
(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*a^(1/2)/(a^2+b^2)^2/d/b^(1/2)-a*e*(e*
cot(d*x+c))^(1/2)/(a^2+b^2)/d/(a+b*cot(d*x+c))
```

Rubi [A] time = 0.68, antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3567, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{e^{3/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}+\frac{e^{3/2}\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\,\cot(c+dx)\right.}{2\sqrt{2}\,d\left(a^2+b^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -((Sqrt[a]*(a^2 - 3*b^2)*e^(3/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqr
t[a]*Sqrt[e])])/(Sqrt[b]*(a^2 + b^2)^2*d)) - ((a^2 - 2*a*b - b^2)*e^(3/2)*A
rcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d
) + ((a^2 - 2*a*b - b^2)*e^(3/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/
Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d) - (a*e*Sqrt[e*Cot[c + d*x]])/((a^2 + b^
2)*d*(a + b*Cot[c + d*x])) - ((a^2 + 2*a*b - b^2)*e^(3/2)*Log[Sqrt[e] + Sqr
t[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2
*d) + ((a^2 + 2*a*b - b^2)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqr
t[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3567

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m
+ 1)*(c + d*Tan[e + f*x])^(n - 1))/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m
 + 1)*(a^2 + b^2)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(
n - 2)*Simp[a*c^2*(m + 1) + a*d^2*(n - 1) + b*c*d*(m - n + 2) - (b*c^2 - 2*
a*c*d - b*d^2)*(m + 1)*Tan[e + f*x] - d*(b*c - a*d)*(m + n)*Tan[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2
 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && LtQ[1, n, 2] && IntegerQ[2
*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{3/2}}{(a+b\cot(c+dx))^2}\,dx = -\frac{ae\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{\frac{ae^2}{2}-be^2\cot(c+dx)-\frac{1}{2}ae^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{a^2+b^2}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{\left(a^2-b^2\right)e^2-2abe^2\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{\left(a^2+b^2\right)^2} + \frac{\left(a\left(a^2-3b^2\right)e^2\right)\int \frac{}{\sqrt{}}}{2\left(a^2\right.}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{2\,\mathrm{Subst}\left(\int \frac{-\left(a^2-b^2\right)e^3+2abe^2x^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{\left(a^2+b^2\right)^2 d}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(a\left(a^2-3b^2\right)e\right)\mathrm{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c+dx}\right.}{\left(a^2+b^2\right)^2 d}$$

$$= -\frac{\sqrt{a}\left(a^2-3b^2\right)e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{b}\left(a^2+b^2\right)^2 d} - \frac{ae\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(\left(a^2+\right.\right.}{}$$

$$= -\frac{\sqrt{a}\left(a^2-3b^2\right)e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{b}\left(a^2+b^2\right)^2 d} - \frac{ae\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(a^2+2\right.}{}$$

$$= -\frac{\sqrt{a}\left(a^2-3b^2\right)e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{b}\left(a^2+b^2\right)^2 d} - \frac{\left(a^2-2ab-b^2\right)e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c}}{\sqrt{e}}\right.}{\sqrt{2}\left(a^2+b^2\right)^2 d}$$

Mathematica [C] time = 3.33, size = 322, normalized size = 0.83

$$-\frac{(e\cot(c+dx))^{3/2}\left(\frac{24b^2\left(a^2+b^2\right)\cot^{\frac{5}{2}}(c+dx)\,{}_2F_1\left(2,\frac{5}{2};\frac{7}{2};-\frac{b\cot(c+dx)}{a}\right)}{a^2} - 240a^2\left(\sqrt{\cot(c+dx)} - \frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)}{\sqrt{b}}\right) + 80ab\,\mathrm{c}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -1/60*((e*Cot[c + d*x])^(3/2)*(-240*a^2*(-((Sqrt[a]*ArcTan[(Sqrt[b]*Sqrt[Co
t[c + d*x]])/Sqrt[a]])/Sqrt[b]) + Sqrt[Cot[c + d*x]]) + 80*a*b*Cot[c + d*x]
```

```
^(3/2) + 80*a*b*Cot[c + d*x]^(3/2)*(-1 + Hypergeometric2F1[3/4, 1, 7/4, -Co
t[c + d*x]^2]) + (24*b^2*(a^2 + b^2)*Cot[c + d*x]^(5/2)*Hypergeometric2F1[2
, 5/2, 7/2, -((b*Cot[c + d*x])/a)])/a^2 + 15*(a - b)*(a + b)*(2*Sqrt[2]*Arc
Tan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot
[c + d*x]]] + 8*Sqrt[Cot[c + d*x]] + Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d
*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c +
 d*x]])))/((a^2 + b^2)^2*d*Cot[c + d*x]^(3/2))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \cot(dx + c))^{\frac{3}{2}}}{(b \cot(dx + c) + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(3/2)/(b*cot(d*x + c) + a)^2, x)
```

maple [B] time = 0.76, size = 768, normalized size = 1.98

$$-\frac{e^2 a^3 \sqrt{e \cot(dx + c)}}{d \left(a^2 + b^2\right)^2 (e \cot(dx + c) b + ae)} - \frac{e^2 a \sqrt{e \cot(dx + c)}\, b^2}{d \left(a^2 + b^2\right)^2 (e \cot(dx + c) b + ae)} - \frac{e^2 a^3 \arctan\left(\frac{\sqrt{e \cot(dx+c)}\, b}{\sqrt{aeb}}\right)}{d \left(a^2 + b^2\right)^2 \sqrt{aeb}} + \frac{3e^2 a \arctan}{d\left(a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x)
```

```
[Out] -1/d*e^2*a^3/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)-1/d*e^2*
a/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)*b^2-1/d*e^2*a^3/(a^
2+b^2)^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+3/d*e^2
*a/(a^2+b^2)^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))*b
^2-1/2/d*e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)*a^2+1/2/d*e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arctan(-2^(
```

```
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/4/d*e/(a^2+b^2)^2*(e^2)^(1/4
)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(
1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*
a^2-1/4/d*e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2+1/2/d*e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/
2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2/d*e/(a^2+b^2)
^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b
^2-1/2/d*e^2/(a^2+b^2)^2*a*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))-1/d*e^2/(a^2+b^2)^2*a*b/(e^2)^(1/4)*
2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d*e^2/(a^2+b^2
)^2*a*b/(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)+1)
```

maxima [A] time = 0.59, size = 344, normalized size = 0.89

$$-\frac{\left(\frac{4\,ae\sqrt{\frac{e}{\tan(dx+c)}}}{\left(a^3+ab^2\right)e+\frac{\left(a^2b+b^3\right)e}{\tan(dx+c)}}+\frac{4\left(a^3-3\,ab^2\right)e\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^4+2\,a^2b^2+b^4\right)\sqrt{abe}}-\frac{\left(\frac{2\sqrt{2}\left(a^2-2\,ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^2-2\,ab-b^2\right)\arctan\left(-\frac{\sqrt{2}\left(\cdots\right.}{\cdots}\right.}{\sqrt{e}}\cdots}{\cdots}\cdots}{4\,d\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/4*(4*a*e*sqrt(e/tan(d*x + c))/((a^3 + a*b^2)*e + (a^2*b + b^3)*e/tan(d*x
 + c)) + 4*(a^3 - 3*a*b^2)*e*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a
^4 + 2*a^2*b^2 + b^4)*sqrt(a*b*e)) - (2*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(
1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2
*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(
e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^2 + 2*a*b - b^2)*log(sqrt(2)
*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(a^2
+ 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x +
c))/sqrt(e))*e/(a^4 + 2*a^2*b^2 + b^4))*e/d
```

mupad [B] time = 3.37, size = 11953, normalized size = 30.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)/(a + b*cot(c + d*x))^2,x)
```

```
[Out] (atan((((a^2 - 3*b^2)*((16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16
- 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 +
4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) + ((a^2 - 3*b^2)*((16*(2*a^1
0*b*d^2*e^15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^
15 - 24*a^8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d
^5 + 4*a^6*b^2*d^5) - ((a^2 - 3*b^2)*((16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^
10*d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^
13 - 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2
*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) + ((a^2 - 3*b^2)*((16*(40*a*b^14*
d^4*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*
e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*
a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (8*(e*cot(c + d*x))^(1/2)*(a
^2 - 3*b^2)*(-a*b*e^3)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 28
8*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^
10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((b^5*d +
2*a^2*b^3*d + a^4*b*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 +
 4*a^6*b^2*d^4)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-
a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2))/(2*(
b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2)*1i)/(2*(b^5*d + 2*a^2*b^3
*d + a^4*b*d)) + ((a^2 - 3*b^2)*((16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a
^8*b*e^16 - 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 +
b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) - ((a^2 - 3*b^2)*(
(16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*
b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6
*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + ((a^2 - 3*b^2)*((16*(e*cot(c + d*x))^(1/2)*
(20*a^3*b^10*d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*
b^6*d^2*e^13 - 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d
^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) - ((a^2 - 3*b^2)*((16*(
40*a*b^14*d^4*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^
7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^
8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (8*(e*cot(c + d*x)
)^(1/2)*(a^2 - 3*b^2)*(-a*b*e^3)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4
*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^1
0 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/
((b^5*d + 2*a^2*b^3*d + a^4*b*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4
*b^4*d^4 + 4*a^6*b^2*d^4)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4
*b*d)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(
1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2)*1i)/(2*(b^5*d +
 2*a^2*b^3*d + a^4*b*d)))/((32*(3*a*b^6*e^18 - a^3*b^4*e^18))/(a^8*d^5 + b^
8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - ((a^2 - 3*b^2)*((1
6*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^16 + 17*a^4
```

```
*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4
*d^4 + 4*a^6*b^2*d^4) + ((a^2 - 3*b^2)*((16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9
*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15)
)/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - ((a
^2 - 3*b^2)*((16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a*b^12*d
^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^2*e^13
+ 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4
+ 4*a^6*b^2*d^4) + ((a^2 - 3*b^2)*((16*(40*a*b^14*d^4*e^12 + 192*a^3*b^12*d
^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^
12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d
^5 + 4*a^6*b^2*d^5) - (8*(e*cot(c + d*x))^(1/2)*(a^2 - 3*b^2)*(-a*b*e^3)^(1
/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160
*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^1
2*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((b^5*d + 2*a^2*b^3*d + a^4*b*d)*(a
^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4)))*(-a*b*e
^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2))/(2*(b^5*d
 + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4
*b*d)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)) + ((a^2 - 3*b
^2)*((16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^16 +
 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*
a^4*b^4*d^4 + 4*a^6*b^2*d^4) - ((a^2 - 3*b^2)*((16*(2*a^10*b*d^2*e^15 - 78*
a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^
2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5
) + ((a^2 - 3*b^2)*((16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a
*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^
2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b
^4*d^4 + 4*a^6*b^2*d^4) - ((a^2 - 3*b^2)*((16*(40*a*b^14*d^4*e^12 + 192*a^3
*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^12 + 120*a^9*b^6
*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^
4*b^4*d^5 + 4*a^6*b^2*d^5) + (8*(e*cot(c + d*x))^(1/2)*(a^2 - 3*b^2)*(-a*b*
e^3)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^1
0 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 -
160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((b^5*d + 2*a^2*b^3*d + a^4*
b*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4)))*
(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2))/(2
*(b^5*d + 2*a^2*b^3*d + a^4*b*d)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*
d + a^4*b*d)))*(-a*b*e^3)^(1/2))/(2*(b^5*d + 2*a^2*b^3*d + a^4*b*d))))*(a^2
 - 3*b^2)*(-a*b*e^3)^(1/2)*1i)/(b^5*d + 2*a^2*b^3*d + a^4*b*d) - atan((((((
(16*(40*a*b^14*d^4*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 3
20*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5
 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (16*(e*cot(c
+ d*x))^(1/2)*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2
 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*
a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10
*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b
```

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^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*
1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16
*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^
5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2
*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4)
)*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d
^2*6i)))^(1/2) - (16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d
^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 +
4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(-e^3/(4*(a^4*d^2*1i + b^4*
d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c
 + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16
- 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a
^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2
- a^2*b^2*d^2*6i)))^(1/2)*1i - (((((16*(40*a*b^14*d^4*e^12 + 192*a^3*b^12*d
^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^
12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d
^5 + 4*a^6*b^2*d^5) + (16*(e*cot(c + d*x))^(1/2)*(-e^3/(4*(a^4*d^2*1i + b^4
*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*
e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^1
0 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 -
32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 +
 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*
d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2
*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 4
4*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d
^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*
a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(2*a^10*b*d^2*e^15
- 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b
^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^
2*d^5))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2
*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16
- 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 +
4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*
d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*1i)/((32*(3*a*
b^6*e^18 - a^3*b^4*e^18))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^
5 + 4*a^6*b^2*d^5) + (((((16*(40*a*b^14*d^4*e^12 + 192*a^3*b^12*d^4*e^12 +
360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^1
3*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6
*b^2*d^5) - (16*(e*cot(c + d*x))^(1/2)*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i +
4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*e^10 + 160
*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^
8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^
3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2
*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*
b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60
```

*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*
d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4
*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2
- 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(2*a^10*b*d^2*e^15 - 78*a^2*b
^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^1
5))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(-
e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6
i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^
7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*
d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4
*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (((((16*(40*a*b^14*d^4
*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^1
2 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2
*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (16*(e*cot(c + d*x))^(1/2)*(-e^
3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)
))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10
+ 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 16
0*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6
*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i +
4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^
(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 4
0*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 +
b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3/(4*(a^4*d^
2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (
16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b
^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*
a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d
^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(2*
b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))
/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-e^3
/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i))
)^(1/2)))*(-e^3/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a
^2*b^2*d^2*6i)))^(1/2)*2i - atan((((((16*(40*a*b^14*d^4*e^12 + 192*a^3*b^1
2*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4
*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^
4*d^5 + 4*a^6*b^2*d^5) - (16*(e*cot(c + d*x))^(1/2)*(-(e^3*1i)/(4*(a^4*d^2
+ b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*d
^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*
e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10
- 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^
4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b
*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*
d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13
- 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^
6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 +

```
a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(2*a^10*b*d^2*e^
15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^
8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6
*b^2*d^5))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i -
 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^
16 - 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4
 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 +
 b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*1i - (((((1
6*(40*a*b^14*d^4*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320
*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 +
 b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (16*(e*cot(c +
d*x))^(1/2)*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i
- 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^
4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b
^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8
*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d
^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(
e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*
b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e
^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*
(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*
d^2)))^(1/2) - (16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2
*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*
a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*
d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c +
 d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 -
7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6
*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i -
 6*a^2*b^2*d^2)))^(1/2)*1i)/((32*(3*a*b^6*e^18 - a^3*b^4*e^18))/(a^8*d^5 +
b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (((((16*(40*a*b^
14*d^4*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a^5*b^10*d^4*e^12 + 320*a^7*b^8*d
^4*e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2*d^4*e^12))/(a^8*d^5 + b^8*d^5 +
 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (16*(e*cot(c + d*x))^(1/2
)*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^
2*d^2)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4
*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^1
0 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a
^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d
^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c +
d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a*b^12*d^2*e^13 + 168*a^5*b^8*d^2*e^
13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^2*e^13 + 4*a^11*b^2*d^2*e^13))/(a^8
*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)
/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/
2) - (16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9*d^2*e^15 + 8*a^4*b^7*d^2*e^15 + 60
*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^
```

```
5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^
3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/
2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^16 + 17*a^4*b^5*e^16 - 7*a^6*b^3*
e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))
*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2
*d^2)))^(1/2) + (((((16*(40*a*b^14*d^4*e^12 + 192*a^3*b^12*d^4*e^12 + 360*a
^5*b^10*d^4*e^12 + 320*a^7*b^8*d^4*e^12 + 120*a^9*b^6*d^4*e^12 - 8*a^13*b^2
*d^4*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*
d^5) + (16*(e*cot(c + d*x))^(1/2)*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*
d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*
b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9
*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4
*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4)
)*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^
2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(20*a^3*b^10*d^2*e^13 - 60*a*b^
12*d^2*e^13 + 168*a^5*b^8*d^2*e^13 + 40*a^7*b^6*d^2*e^13 - 44*a^9*b^4*d^2*e
^13 + 4*a^11*b^2*d^2*e^13))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*
d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3
*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(2*a^10*b*d^2*e^15 - 78*a^2*b^9*d^
2*e^15 + 8*a^4*b^7*d^2*e^15 + 60*a^6*b^5*d^2*e^15 - 24*a^8*b^3*d^2*e^15))/(
a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(-(e^3*
1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^
(1/2) + (16*(e*cot(c + d*x))^(1/2)*(2*b^9*e^16 + a^8*b*e^16 - 5*a^2*b^7*e^1
6 + 17*a^4*b^5*e^16 - 7*a^6*b^3*e^16))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 +
 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(-(e^3*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d
^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)))*(-(e^3*1i)/(4*(a^4*d^2 + b^
4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*2i - (a*e^2*(e
*cot(c + d*x))^(1/2))/((a*d*e + b*d*e*cot(c + d*x))*(a^2 + b^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(c+dx))^{\frac{3}{2}}}{(a+b\cot(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)/(a+b*cot(d*x+c))**2,x)
```

```
[Out] Integral((e*cot(c + d*x))**(3/2)/(a + b*cot(c + d*x))**2, x)
```

3.78 $\int \frac{\sqrt{e\cot(c+dx)}}{(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=386

$$\frac{b\sqrt{e\cot(c+dx)}}{d\left(a^2+b^2\right)(a+b\cot(c+dx))}-\frac{\sqrt{e}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}+\frac{\sqrt{e}\left(a^2-2\right.}{}$$

```
[Out] 1/2*(a^2+2*a*b-b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/
(a^2+b^2)^2/d*2^(1/2)-1/2*(a^2+2*a*b-b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(
1/2)/e^(1/2))*e^(1/2)/(a^2+b^2)^2/d*2^(1/2)-1/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+
cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/(a^2+b^2)^2/d*2^(1
/2)+1/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c)
)^(1/2))*e^(1/2)/(a^2+b^2)^2/d*2^(1/2)+(3*a^2-b^2)*arctan(b^(1/2)*(e*cot(d*
x+c))^(1/2)/a^(1/2)/e^(1/2))*b^(1/2)*e^(1/2)/(a^2+b^2)^2/d/a^(1/2)+b*(e*cot
(d*x+c))^(1/2)/(a^2+b^2)/d/(a+b*cot(d*x+c))
```

Rubi [A] time = 0.65, antiderivative size = 386, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3568, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{b\sqrt{e\cot(c+dx)}}{d\left(a^2+b^2\right)(a+b\cot(c+dx))}-\frac{\sqrt{e}\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^2}+\frac{\sqrt{e}\left(a^2-2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] (Sqrt[b]*(3*a^2 - b^2)*Sqrt[e]*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[
a]*Sqrt[e])])/(Sqrt[a]*(a^2 + b^2)^2*d) + ((a^2 + 2*a*b - b^2)*Sqrt[e]*ArcT
an[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d) -
 ((a^2 + 2*a*b - b^2)*Sqrt[e]*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqr
t[e]])/(Sqrt[2]*(a^2 + b^2)^2*d) + (b*Sqrt[e*Cot[c + d*x]])/((a^2 + b^2)*d*
(a + b*Cot[c + d*x])) - ((a^2 - 2*a*b - b^2)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*
Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d) +
 ((a^2 - 2*a*b - b^2)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*
Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3568

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(a + b*Tan[e + f*x])^(m + 1)*(c +
d*Tan[e + f*x])^n)/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m + 1)*(a^2 + b^2
)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n - 1)*Simp[a*c*
(m + 1) - b*d*n - (b*c - a*d)*(m + 1)*Tan[e + f*x] - b*d*(m + n + 1)*Tan[e
+ f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &
& NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && GtQ[n, 0] && Inte
gerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{e\cot(c+dx)}}{(a+b\cot(c+dx))^2}\,dx = \frac{b\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{-\frac{be}{2}-ae\cot(c+dx)+\frac{1}{2}be\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}\,dx}{a^2+b^2}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\int \frac{-2abe-\left(a^2-b^2\right)e\cot(c+dx)}{\sqrt{e\cot(c+dx)}}\,dx}{\left(a^2+b^2\right)^2} - \frac{\left(b\left(3a^2-b^2\right)e\right)\int \frac{}{\sqrt{e\cot}}}{2\left(a^2+\right.}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{2\,\text{Subst}\left(\int \frac{2abe^2+\left(a^2-b^2\right)ex^2}{e^2+x^4}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{\left(a^2+b^2\right)^2 d} - \frac{(}{}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{\left(b\left(3a^2-b^2\right)\right)\text{Subst}\left(\int \frac{1}{a+\frac{bx^2}{e}}\,dx, x, \sqrt{e\cot(c+dx)}\right)}{\left(a^2+b^2\right)^2 d}$$

$$= \frac{\sqrt{b}\left(3a^2-b^2\right)\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{a}\left(a^2+b^2\right)^2 d} + \frac{b\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(\left(a^2-2a\right.\right.}{}$$

$$= \frac{\sqrt{b}\left(3a^2-b^2\right)\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{a}\left(a^2+b^2\right)^2 d} + \frac{b\sqrt{e\cot(c+dx)}}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(a^2-2a\right.}{}$$

$$= \frac{\sqrt{b}\left(3a^2-b^2\right)\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{a}\left(a^2+b^2\right)^2 d} + \frac{\left(a^2+2ab-b^2\right)\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cot(c+}}{\sqrt{e}}\right.}{\sqrt{2}\left(a^2+b^2\right)^2 d}$$

Mathematica [C] time = 6.10, size = 401, normalized size = 1.04

$$-\frac{\sqrt{e\cot(c+dx)}\left(\frac{2(a-b)(a+b)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)}{3\left(a^2+b^2\right)^2} + \frac{4ab\sqrt{\cot(c+dx)}}{\left(a^2+b^2\right)^2} - \frac{\sqrt{b}\left(\sqrt{a}\sqrt{b}\sqrt{\cot(c+dx)}-a\tan^{-1}\left(\frac{\sqrt{b}\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)-b\,c\right.}{\sqrt{a}\left(a^2+b^2\right)(a+b\cot(c+}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] -((Sqrt[e*Cot[c + d*x]]*((-4*a^(3/2)*Sqrt[b]*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d
*x]])/Sqrt[a]])/(a^2 + b^2)^2 + (4*a*b*Sqrt[Cot[c + d*x]])/(a^2 + b^2)^2 -
(Sqrt[b]*(-(a*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]]) + Sqrt[a]*Sqrt[
```

```
b]*Sqrt[Cot[c + d*x]] - b*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]]*Cot[
c + d*x]))/(Sqrt[a]*(a^2 + b^2)*(a + b*Cot[c + d*x])) + (2*(a - b)*(a + b)*
Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2])/(3*(a^2
 + b^2)^2) - (a*b*(2*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqrt
[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]) + 8*Sqrt[Cot[c + d*x]] + Sqrt[2
]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt
[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/(2*(a^2 + b^2)^2)))/(d*Sqrt[Cot[c
+ d*x]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \cot(dx+c)}}{(b \cot(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x, algorithm="giac")
[Out] integrate(sqrt(e*cot(d*x + c))/(b*cot(d*x + c) + a)^2, x)
```

maple [B] time = 0.82, size = 749, normalized size = 1.94

$$\frac{eb\sqrt{e\cot(dx+c)}\,a^2}{d\left(a^2+b^2\right)^2\left(e\cot(dx+c)b+ae\right)}+\frac{e\,b^3\sqrt{e\cot(dx+c)}}{d\left(a^2+b^2\right)^2\left(e\cot(dx+c)b+ae\right)}+\frac{3eb\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)a^2}{d\left(a^2+b^2\right)^2\sqrt{aeb}}-\frac{e\,b^3\operatorname{arctar}}{d\left(a^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x)
[Out] 1/d*e*b/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)*a^2+1/d*e*b^3
/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)+3/d*e*b/(a^2+b^2)^2/
(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))*a^2-1/d*e*b^3/(a
^2+b^2)^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-1/2/d/
(a^2+b^2)^2*a*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x
```

```
+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1
/2)*2^(1/2)+(e^2)^(1/2)))-1/d/(a^2+b^2)^2*a*b*(e^2)^(1/4)*2^(1/2)*arctan(2^
(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/d/(a^2+b^2)^2*a*b*(e^2)^(1/4)*2
^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+1/2/d*e/(a^2+b^2
)^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
*a^2-1/2/d*e/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)+1)*b^2-1/2/d*e/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(2^
(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2/d*e/(a^2+b^2)^2*2^(1/2)/(
e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/4/d*e/(
a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2)))*a^2+1/4/d*e/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(
d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2
```

maxima [A] time = 0.67, size = 343, normalized size = 0.89

$$\frac{e\left(\frac{4\,b\sqrt{\frac{e}{\tan(dx+c)}}}{\left(a^3+ab^2\right)e+\frac{\left(a^2b+b^3\right)e}{\tan(dx+c)}}+\frac{4\left(3\,a^2b-b^3\right)\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^4+2\,a^2b^2+b^4\right)\sqrt{abe}}-\frac{\frac{2\,\sqrt{2}\left(a^2+2\,ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^2+2\,ab-b^2\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\cdots\right.}{\cdots}\right)}{\sqrt{e}}\cdots}{\cdots}\right)}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/4*e*(4*b*sqrt(e/tan(d*x + c))/((a^3 + a*b^2)*e + (a^2*b + b^3)*e/tan(d*x
+ c)) + 4*(3*a^2*b - b^3)*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a^4
+ 2*a^2*b^2 + b^4)*sqrt(a*b*e)) - (2*sqrt(2)*(a^2 + 2*a*b - b^2)*arctan(1/2
*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sq
rt(2)*(a^2 + 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/t
an(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^2 - 2*a*b - b^2)*log(sqrt(2)*sq
rt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*(a^2 - 2
*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))
/sqrt(e))/(a^4 + 2*a^2*b^2 + b^4))/d
```

mupad [B] time = 3.08, size = 11731, normalized size = 30.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)/(a + b*cot(c + d*x))^2,x)
```

```
[Out] (b*e*(e*cot(c + d*x))^(1/2))/((a*d*e + b*d*e*cot(c + d*x))*(a^2 + b^2)) - a
tan((((((8*(320*a^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11
 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a
^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (16*(e*
cot(c + d*x))^(1/2)*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*
d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 2
88*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a
^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4
+ b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*
1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16
*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5
*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*
e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))
*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6
i)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2
*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*
a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(e/(4*(a^4*d^2*1i + b^4*d^2*1
i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*
x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^6*b^3*e^12))
/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4
*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(
1/2)*1i - (((((8*(320*a^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4*e^11 - 32*b^15*d^4
*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11
))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (1
6*(e*cot(c + d*x))^(1/2)*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a
^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^1
0 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 -
288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8
*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4
*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)
- (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 8
8*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2
*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*
d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*
d^2*6i)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^
6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5
 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(e/(4*(a^4*d^2*1i + b^4*
d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c
 + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^6*b^3*e
^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*
(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i
)))^(1/2)*1i)/((((((8*(320*a^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4*e^11 - 32*b^1
5*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4
*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5)
 - (16*(e*cot(c + d*x))^(1/2)*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2
```

- 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (((((8*(320*a^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (16*(e*cot(c + d*x))^(1/2)*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2) - (16*(b^7*e^13 - 9*a^4*b^3*e^13))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5)))*(e/(4*(a^4*d^2*1i + b^4*d^2*1i + 4*a*b^3*d^2 - 4*a^3*b*d^2 - a^2*b^2*d^2*6i)))^(1/2)*2i - (atan((((3*a^2 - b^2)*((16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) - (((8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (((16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^

```
11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8
*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) + (((8*(320
*a^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d
^4*e^11 + 288*a^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5
 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (8*(e*cot(c + d*x))^(1/
2)*(3*a^2 - b^2)*(-a*b*e)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 +
 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288
*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((a^5*d
 + 2*a^3*b^2*d + a*b^4*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^
4 + 4*a^6*b^2*d^4)))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d
+ a*b^4*d)))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*
d)))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d))*(-a
*b*e)^(1/2)*1i)/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)) + ((3*a^2 - b^2)*((16*(
e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^
6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2
*d^4) + (((8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^
12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2
*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (((16*(e*cot(c + d*x))^(1/2)*(6
8*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6
*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4
+ 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) - (((8*(320*a^6*b^9*d^4*e^
11 - 96*a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a
^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^
5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (8*(e*cot(c + d*x))^(1/2)*(3*a^2 - b^2
)*(-a*b*e)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d
^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e
^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((a^5*d + 2*a^3*b^2*d
+ a*b^4*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d
^4)))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(3
*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(3*a^2 - b
^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(-a*b*e)^(1/2)*1i)
/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))/((16*(b^7*e^13 - 9*a^4*b^3*e^13))/(a^
8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + ((3*a^2
- b^2)*((16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^
5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^
4 + 4*a^6*b^2*d^4) - (((8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a
^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^
8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (((16*(e*cot(c + d
*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11
 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d
^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) + (((8*(320*a
^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4
*e^11 + 288*a^10*b^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 +
 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (8*(e*cot(c + d*x))^(1/2)
*(3*a^2 - b^2)*(-a*b*e)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 2
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88*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a
^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((a^5*d +
 2*a^3*b^2*d + a*b^4*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4
+ 4*a^6*b^2*d^4)))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d +
a*b^4*d)))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)
))*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(-a*b
*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)) - ((3*a^2 - b^2)*((16*(e*cot
(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5*e^12 - 9*a^6*b^3
*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4)
 + (((8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 +
160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*
d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5) - (((16*(e*cot(c + d*x))^(1/2)*(68*a*b
^12*d^2*e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*
e^11 + 84*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a
^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4) - (((8*(320*a^6*b^9*d^4*e^11 -
96*a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b
^5*d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6
*a^4*b^4*d^5 + 4*a^6*b^2*d^5) + (8*(e*cot(c + d*x))^(1/2)*(3*a^2 - b^2)*(-a
*b*e)^(1/2)*(32*b^17*d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^
10 + 160*a^6*b^11*d^4*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 -
 160*a^12*b^5*d^4*e^10 - 32*a^14*b^3*d^4*e^10))/((a^5*d + 2*a^3*b^2*d + a*b
^4*d)*(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4)))
*(3*a^2 - b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(3*a^2
- b^2)*(-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(3*a^2 - b^2)*(
-a*b*e)^(1/2))/(2*(a^5*d + 2*a^3*b^2*d + a*b^4*d)))*(-a*b*e)^(1/2))/(2*(a^5
*d + 2*a^3*b^2*d + a*b^4*d))))*(3*a^2 - b^2)*(-a*b*e)^(1/2)*1i)/(a^5*d + 2*
a^3*b^2*d + a*b^4*d) - atan((((((8*(320*a^6*b^9*d^4*e^11 - 96*a^2*b^13*d^4
*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^4*e^11 + 6
4*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 +
4*a^6*b^2*d^5) - (16*(e*cot(c + d*x))^(1/2)*((e*1i)/(4*(a^4*d^2 + b^4*d^2 +
 a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*d^4*e^10 + 1
60*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 - 160*
a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*a^14*
b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*a^6*b
^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^
2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 + 20*a^
3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b^4*d^
2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b
^4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3
*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128*a^3*b^8*d
^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e^12))
/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*((e*1
i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(
1/2) - (16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^4*b^5
*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4
```

+ 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2
*4i - 6*a^2*b^2*d^2)))^(1/2)*1i - (((((8*(320*a^6*b^9*d^4*e^11 - 96*a^2*b^1
3*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^4*e^1
1 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d
^5 + 4*a^6*b^2*d^5) + (16*(e*cot(c + d*x))^(1/2)*((e*1i)/(4*(a^4*d^2 + b^4*
d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*d^4*e^1
0 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e^10 -
160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10 - 32*
a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4 + 4*
a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i -
6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^11 +
20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*a^9*b
^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*
a^4*b^4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i
- a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128*a^3*
b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*d^2*e
^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5))*
((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2
)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 + 17*a^
4*b^5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^
4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*
b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*1i)/((((((8*(320*a^6*b^9*d^4*e^11 - 96*a^
2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*d^
4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*
b^4*d^5 + 4*a^6*b^2*d^5) - (16*(e*cot(c + d*x))^(1/2)*((e*1i)/(4*(a^4*d^2 +
b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*d^
4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4*e
^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^10
- 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d^4
+ 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2
*4i - 6*a^2*b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*e^
11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 84*
a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4
+ 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^
2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 128
*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^2*
d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d
^5))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^
2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12 +
17*a^4*b^5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a
^4*b^4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i -
a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (((((8*(320*a^6*b^9*d^4*e^11 - 96*
a^2*b^13*d^4*e^11 - 32*b^15*d^4*e^11 + 480*a^8*b^7*d^4*e^11 + 288*a^10*b^5*
d^4*e^11 + 64*a^12*b^3*d^4*e^11))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^
4*b^4*d^5 + 4*a^6*b^2*d^5) + (16*(e*cot(c + d*x))^(1/2)*((e*1i)/(4*(a^4*d^2

```
 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2)*(32*b^17*
d^4*e^10 + 160*a^2*b^15*d^4*e^10 + 288*a^4*b^13*d^4*e^10 + 160*a^6*b^11*d^4
*e^10 - 160*a^8*b^9*d^4*e^10 - 288*a^10*b^7*d^4*e^10 - 160*a^12*b^5*d^4*e^1
0 - 32*a^14*b^3*d^4*e^10))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6*a^4*b^4*d
^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d
^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(68*a*b^12*d^2*
e^11 + 20*a^3*b^10*d^2*e^11 - 88*a^5*b^8*d^2*e^11 + 40*a^7*b^6*d^2*e^11 + 8
4*a^9*b^4*d^2*e^11 + 4*a^11*b^2*d^2*e^11))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d
^4 + 6*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*
d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) + (8*(52*a*b^10*d^2*e^12 - 1
28*a^3*b^8*d^2*e^12 - 24*a^5*b^6*d^2*e^12 + 160*a^7*b^4*d^2*e^12 + 4*a^9*b^
2*d^2*e^12))/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2
*d^5))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*
b^2*d^2)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(3*b^9*e^12 - 3*a^2*b^7*e^12
+ 17*a^4*b^5*e^12 - 9*a^6*b^3*e^12))/(a^8*d^4 + b^8*d^4 + 4*a^2*b^6*d^4 + 6
*a^4*b^4*d^4 + 4*a^6*b^2*d^4))*((e*1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i
 - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^(1/2) - (16*(b^7*e^13 - 9*a^4*b^3*e^13))
/(a^8*d^5 + b^8*d^5 + 4*a^2*b^6*d^5 + 6*a^4*b^4*d^5 + 4*a^6*b^2*d^5)))*((e*
1i)/(4*(a^4*d^2 + b^4*d^2 + a*b^3*d^2*4i - a^3*b*d^2*4i - 6*a^2*b^2*d^2)))^
(1/2)*2i
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cot(c+dx)}}{(a+b\cot(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)/(a+b*cot(d*x+c))**2,x)
```

```
[Out] Integral(sqrt(e*cot(c + d*x))/(a + b*cot(c + d*x))**2, x)
```

3.79 $\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=394

$$-\frac{b^2\sqrt{e\cot(c+dx)}}{ade\left(a^2+b^2\right)(a+b\cot(c+dx))}+\frac{\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}\left(a^2+b^2\right)^2}-\frac{\left(a^2+2ab\right.}{}$$

```
[Out] -b^(3/2)*(5*a^2+b^2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/a
^(3/2)/(a^2+b^2)^2/d/e^(1/2)+1/2*(a^2-2*a*b-b^2)*arctan(1-2^(1/2)*(e*cot(d*
x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)/e^(1/2)-1/2*(a^2-2*a*b-b^2)*arct
an(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d*2^(1/2)/e^(1/2)+1/
4*(a^2+2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2
))/(a^2+b^2)^2/d*2^(1/2)/e^(1/2)-1/4*(a^2+2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*
e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^2/d*2^(1/2)/e^(1/2)-b^2*(e*
cot(d*x+c))^(1/2)/a/(a^2+b^2)/d/e/(a+b*cot(d*x+c))
```

Rubi [A] time = 0.74, antiderivative size = 394, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3569, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{b^2\sqrt{e\cot(c+dx)}}{ade\left(a^2+b^2\right)(a+b\cot(c+dx))}+\frac{\left(a^2+2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\sqrt{e}\left(a^2+b^2\right)^2}-\frac{\left(a^2+2ab\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^2),x]
```

```
[Out] -((b^(3/2)*(5*a^2 + b^2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqr
t[e])])/(a^(3/2)*(a^2 + b^2)^2*d*Sqrt[e])) + ((a^2 - 2*a*b - b^2)*ArcTan[1
- (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d*Sqrt[e]
) - ((a^2 - 2*a*b - b^2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]]
)/(Sqrt[2]*(a^2 + b^2)^2*d*Sqrt[e]) - (b^2*Sqrt[e*Cot[c + d*x]])/(a*(a^2 +
b^2)*d*e*(a + b*Cot[c + d*x])) + ((a^2 + 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]
*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d*S
qrt[e]) - ((a^2 + 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]
*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d*Sqrt[e])
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2}\,dx = -\frac{b^2\sqrt{e\cot(c+dx)}}{a\left(a^2+b^2\right)de(a+b\cot(c+dx))} - \frac{\int \frac{-\frac{1}{2}\left(2a^2+b^2\right)e+abe\cot(c+dx)-\frac{1}{2}b^2e\cot^2(}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))}}{a\left(a^2+b^2\right)e}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{a\left(a^2+b^2\right)de(a+b\cot(c+dx))} + \frac{\left(b^2\left(5a^2+b^2\right)\right)\int \frac{1+\cot^2(c+d}{\sqrt{e\cot(c+dx)}\,(a+b\,c}}{2a\left(a^2+b^2\right)^2}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{a\left(a^2+b^2\right)de(a+b\cot(c+dx))} + \frac{\left(b^2\left(5a^2+b^2\right)\right)\text{Subst}\left(\int \frac{1}{\sqrt{-ex}\,(a-}\right.}{2a\left(a^2+b^2\right)}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{a\left(a^2+b^2\right)de(a+b\cot(c+dx))} - \frac{\left(a^2-2ab-b^2\right)\text{Subst}\left(\int \frac{e+x^2}{e^2+x^4}\,dx\right.}{\left(a^2+b^2\right)^2 d}$$

$$= -\frac{b^{3/2}\left(5a^2+b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{3/2}\left(a^2+b^2\right)^2 d\sqrt{e}} - \frac{b^2\sqrt{e\cot(c+dx)}}{a\left(a^2+b^2\right)de(a+b\cot(c+}$$

$$= -\frac{b^{3/2}\left(5a^2+b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{3/2}\left(a^2+b^2\right)^2 d\sqrt{e}} - \frac{b^2\sqrt{e\cot(c+dx)}}{a\left(a^2+b^2\right)de(a+b\cot(c+}$$

$$= -\frac{b^{3/2}\left(5a^2+b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{3/2}\left(a^2+b^2\right)^2 d\sqrt{e}} + \frac{\left(a^2-2ab-b^2\right)\tan^{-1}\left(1-\right.}{\sqrt{2}\left(a^2+b^2\right)^2 d\sqrt{}}$$

Mathematica [C] time = 2.86, size = 300, normalized size = 0.76

$$-\frac{\sqrt{\cot(c+dx)}\left(\frac{24b^2\left(a^2+b^2\right)\sqrt{\cot(c+dx)}\left(\frac{a}{a+b\cot(c+dx)}+\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)}{\sqrt{b}\,\sqrt{\cot(c+dx)}}\right)}{a^2}+96\sqrt{a}\,b^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)-32ab\cot^{\frac{3}{2}}(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^2),x]
```

```
[Out] -1/24*(Sqrt[Cot[c + d*x]]*(96*Sqrt[a]*b^(3/2)*ArcTan[(Sqrt[b]*Sqrt[Cot[c +
d*x]])/Sqrt[a]] + (24*b^2*(a^2 + b^2)*Sqrt[Cot[c + d*x]]*((Sqrt[a]*ArcTan[(
Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]])/(Sqrt[b]*Sqrt[Cot[c + d*x]]) + a/(a +
 b*Cot[c + d*x])))/a^2 - 32*a*b*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1
, 7/4, -Cot[c + d*x]^2] - 6*Sqrt[2]*(a - b)*(a + b)*(2*ArcTan[1 - Sqrt[2]*S
qrt[Cot[c + d*x]]] - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] + Log[1 - Sqr
t[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]
] + Cot[c + d*x]]))))/((a^2 + b^2)^2*d*Sqrt[e*Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(b\cot\left(dx+c\right)+a\right)^{2}\sqrt{e\cot\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)^2*sqrt(e*cot(d*x + c))), x)
```

maple [B] time = 0.85, size = 765, normalized size = 1.94

$$-\frac{b^{2}a\sqrt{e\cot\left(dx+c\right)}}{d\left(a^{2}+b^{2}\right)^{2}\left(e\cot\left(dx+c\right)b+ae\right)}-\frac{b^{4}\sqrt{e\cot\left(dx+c\right)}}{d\left(a^{2}+b^{2}\right)^{2}a\left(e\cot\left(dx+c\right)b+ae\right)}-\frac{5b^{2}a\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{d\left(a^{2}+b^{2}\right)^{2}\sqrt{aeb}}-\frac{b^{4}\operatorname{arctan}}{d\left(a^{2}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x)
```

```
[Out] -1/d*b^2/(a^2+b^2)^2*a*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)-1/d*b^4/(a
^2+b^2)^2/a*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)-5/d*b^2/(a^2+b^2)^2*a
/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-1/d*b^4/(a^2+b^
2)^2/a/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-1/2/d/e/(
a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1
```

```
/2)+1)*a^2+1/2/d/e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)+1)*b^2+1/2/d/e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*arct
an(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2-1/2/d/e/(a^2+b^2)^2*(e^
2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/
4/d/e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^
(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2+1/4/d/e/(a^2+b^2)^2*(e^2)^(1/4)*2^(1/2)*ln(
(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(
d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2+1/2/d/(a^
2+b^2)^2*a*b/(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
*2^(1/2)+(e^2)^(1/2)))+1/d/(a^2+b^2)^2*a*b/(e^2)^(1/4)*2^(1/2)*arctan(2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d/(a^2+b^2)^2*a*b/(e^2)^(1/4)*2^(1
/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)
```

maxima [A] time = 0.53, size = 360, normalized size = 0.91

$$-\frac{\left(\frac{4\,b^2\sqrt{\frac{e}{\tan(dx+c)}}}{\left(a^4+a^2b^2\right)e^2+\frac{\left(a^3b+ab^3\right)e^2}{\tan(dx+c)}}+\frac{4\left(5\,a^2b^2+b^4\right)\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^5+2\,a^3b^2+ab^4\right)\sqrt{abe}\,e}+\frac{2\,\sqrt{2}\left(a^2-2\,ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^2-2\,ab-b^2\right)\arctan\left(-\cdots\right)}{\cdots}\cdots\right)}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/4*(4*b^2*sqrt(e/tan(d*x + c))/((a^4 + a^2*b^2)*e^2 + (a^3*b + a*b^3)*e^2
/tan(d*x + c)) + 4*(5*a^2*b^2 + b^4)*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b
*e))/((a^5 + 2*a^3*b^2 + a*b^4)*sqrt(a*b*e)*e) + (2*sqrt(2)*(a^2 - 2*a*b -
b^2)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))
/sqrt(e) + 2*sqrt(2)*(a^2 - 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(
e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^2 + 2*a*b - b^2)
*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - s
qrt(2)*(a^2 + 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e +
e/tan(d*x + c))/sqrt(e))/((a^4 + 2*a^2*b^2 + b^4)*e))*e/d
```

mupad [B] time = 8.16, size = 9400, normalized size = 23.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(1/2)*(a + b*cot(c + d*x))^2),x)
```

```
[Out] (log(- (((((((((128*b^2*e^10*(2*b^6 - a^6 + 9*a^2*b^4 + 6*a^4*b^2))/(a*d) -
 256*b^3*e^10*(e*cot(c + d*x))^(1/2)*(a^2 - b^2)*(a^2 + b^2)^2*(1i/(d^2*e*(
a*1i - b)^4))^(1/2))*(1i/(d^2*e*(a*1i - b)^4))^(1/2))/2 - (64*b^2*e^9*(e*co
t(c + d*x))^(1/2)*(2*b^8 - a^8 + 5*a^2*b^6 + 67*a^4*b^4 - a^6*b^2))/(a*d^2*
(a^2 + b^2)^2))*(1i/(d^2*e*(a*1i - b)^4))^(1/2))/2 - (32*b^5*e^9*(25*a^6 +
b^6 - 13*a^2*b^4 - 85*a^4*b^2))/(a^2*d^3*(a^2 + b^2)^3))*(1i/(d^2*e*(a*1i -
 b)^4))^(1/2))/2 - (16*b^5*e^8*(e*cot(c + d*x))^(1/2)*(b^6 - 27*a^6 + 7*a^2
*b^4 + 11*a^4*b^2))/(a^2*d^4*(a^2 + b^2)^4))*(1i/(d^2*e*(a*1i - b)^4))^(1/2
))/2 - (16*b^6*e^8*(5*a^2 + b^2))/(a*d^5*(a^2 + b^2)^4))*(-1/(a^4*d^2*e*1i
+ b^4*d^2*e*1i - a^2*b^2*d^2*e*6i + 4*a*b^3*d^2*e - 4*a^3*b*d^2*e))^(1/2))/
2 - log(- (((((((((128*b^2*e^10*(2*b^6 - a^6 + 9*a^2*b^4 + 6*a^4*b^2))/(a*d
) + 256*b^3*e^10*(e*cot(c + d*x))^(1/2)*(a^2 - b^2)*(a^2 + b^2)^2*(1i/(d^2*
e*(a*1i - b)^4))^(1/2))*(1i/(d^2*e*(a*1i - b)^4))^(1/2))/2 + (64*b^2*e^9*(e
*cot(c + d*x))^(1/2)*(2*b^8 - a^8 + 5*a^2*b^6 + 67*a^4*b^4 - a^6*b^2))/(a*d
^2*(a^2 + b^2)^2))*(1i/(d^2*e*(a*1i - b)^4))^(1/2))/2 - (32*b^5*e^9*(25*a^6
 + b^6 - 13*a^2*b^4 - 85*a^4*b^2))/(a^2*d^3*(a^2 + b^2)^3))*(1i/(d^2*e*(a*1
i - b)^4))^(1/2))/2 + (16*b^5*e^8*(e*cot(c + d*x))^(1/2)*(b^6 - 27*a^6 + 7*
a^2*b^4 + 11*a^4*b^2))/(a^2*d^4*(a^2 + b^2)^4))*(1i/(d^2*e*(a*1i - b)^4))^(
1/2))/2 - (16*b^6*e^8*(5*a^2 + b^2))/(a*d^5*(a^2 + b^2)^4))*(-1/(4*(a^4*d^2
*e*1i + b^4*d^2*e*1i - a^2*b^2*d^2*e*6i + 4*a*b^3*d^2*e - 4*a^3*b*d^2*e)))^
(1/2) + atan(((-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*
e*4i - a^3*b*d^2*e*4i)))^(1/2)*(((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9
+ 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^
5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (-1i/(4*
(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)
))^(1/2)*((-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i
 - a^3*b*d^2*e*4i)))^(1/2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10
 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 2
16*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d
^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) - (16*(-1
i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*
e*4i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d
^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*
e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10
))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)
) + (16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 31
6*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^
4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 +
6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2
*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2) + (16*(e*cot(c + d*x))^(1
/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4
 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4))*1i - (-1i/
(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*
4i)))^(1/2)*(((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e
^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2*b^8*d^5 + 4
```

*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*((-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (16*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)) - (16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4))*1i)/((-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*(((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*((-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) - (16*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)) + (16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2) + (16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)) + (-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*(((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i -

a^3*b*d^2*e*4i)))^(1/2)*((-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (16*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)) - (16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2) - (16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)) + (32*(a*b^8*e^8 + 5*a^3*b^6*e^8))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5)))*(-1i/(4*(a^4*d^2*e + b^4*d^2*e - 6*a^2*b^2*d^2*e + a*b^3*d^2*e*4i - a^3*b*d^2*e*4i)))^(1/2)*2i + (atan((((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) + ((5*a^2 + b^2)*((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) + ((5*a^2 + b^2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) - (8*(e*cot(c + d*x))^(1/2)*(5*a^2 + b^2)*(-a^3*b^3*e)^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/((a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)*(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2)*1i)/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)) + ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) - ((5*a^2 + b^2)*((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2 *b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) - ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) - ((5*a^2 + b^2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + (8*(e*cot(c + d*x))^(1/2)*(5*a^2 + b^2)*(-a^3*b^3*e)^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/((a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)*(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2)*1i)/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))/((32*(a*b^8*e^8 + 5*a^3*b^6*e^8))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) + ((5*a^2 + b^2)*((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) + ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) + ((5*a^2 + b^2)*((16*(16*a*b^16*d^4*e^10 + 136*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) - (8*(e*cot(c + d*x))^(1/2)*(5*a^2 + b^2)*(-a^3*b^3*e)^(1/2)*(32*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/((a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)*(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)) - ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(b^11*e^8 + 7*a^2*b^9*e^8 + 11*a^4*b^7*e^8 - 27*a^6*b^5*e^8))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4) - ((5*a^2 + b^2)*((16*(24*a^2*b^11*d^2*e^9 - 2*b^13*d^2*e^9 + 196*a^4*b^9*d^2*e^9 + 120*a^6*b^7*d^2*e^9 - 50*a^8*b^5*d^2*e^9))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^8*b^2*d^5) - ((5*a^2 + b^2)*((16*(e*cot(c + d*x))^(1/2)*(8*a*b^14*d^2*e^9 + 36*a^3*b^12*d^2*e^9 + 316

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*a^5*b^10*d^2*e^9 + 552*a^7*b^8*d^2*e^9 + 256*a^9*b^6*d^2*e^9 - 12*a^11*b^4
*d^2*e^9 - 4*a^13*b^2*d^2*e^9))/(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6
*a^6*b^4*d^4 + 4*a^8*b^2*d^4) - ((5*a^2 + b^2)*((16*(16*a*b^16*d^4*e^10 + 1
36*a^3*b^14*d^4*e^10 + 432*a^5*b^12*d^4*e^10 + 680*a^7*b^10*d^4*e^10 + 560*
a^9*b^8*d^4*e^10 + 216*a^11*b^6*d^4*e^10 + 16*a^13*b^4*d^4*e^10 - 8*a^15*b^
2*d^4*e^10))/(a^10*d^5 + a^2*b^8*d^5 + 4*a^4*b^6*d^5 + 6*a^6*b^4*d^5 + 4*a^
8*b^2*d^5) + (8*(e*cot(c + d*x))^(1/2)*(5*a^2 + b^2)*(-a^3*b^3*e)^(1/2)*(32
*a^2*b^17*d^4*e^10 + 160*a^4*b^15*d^4*e^10 + 288*a^6*b^13*d^4*e^10 + 160*a^
8*b^11*d^4*e^10 - 160*a^10*b^9*d^4*e^10 - 288*a^12*b^7*d^4*e^10 - 160*a^14*
b^5*d^4*e^10 - 32*a^16*b^3*d^4*e^10))/((a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d
*e)*(a^10*d^4 + a^2*b^8*d^4 + 4*a^4*b^6*d^4 + 6*a^6*b^4*d^4 + 4*a^8*b^2*d^4
)))*(-a^3*b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*
b^3*e)^(1/2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/
2))/(2*(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e)))*(-a^3*b^3*e)^(1/2))/(2*(a^
7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e))))*(5*a^2 + b^2)*(-a^3*b^3*e)^(1/2)*1i
)/(a^7*d*e + a^3*b^4*d*e + 2*a^5*b^2*d*e) - (b^2*(e*cot(c + d*x))^(1/2))/(a
*(a*d*e + b*d*e*cot(c + d*x))*(a^2 + b^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e \cot(c + dx)}\,(a + b \cot(c + dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(1/2)/(a+b*cot(d*x+c))**2,x)
```

```
[Out] Integral(1/(sqrt(e*cot(c + d*x))*(a + b*cot(c + d*x))**2), x)
```

3.80 $\int \frac{1}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=437

$$\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)^2}-\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}\right.}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)^2}$$

```
[Out] b^(5/2)*(7*a^2+3*b^2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))/
a^(5/2)/(a^2+b^2)^2/d/e^(3/2)-1/2*(a^2+2*a*b-b^2)*arctan(1-2^(1/2)*(e*cot(d
*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d/e^(3/2)*2^(1/2)+1/2*(a^2+2*a*b-b^2)*arc
tan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^2/d/e^(3/2)*2^(1/2)+1
/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/
2))/(a^2+b^2)^2/d/e^(3/2)*2^(1/2)-1/4*(a^2-2*a*b-b^2)*ln(e^(1/2)+cot(d*x+c)
*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^2/d/e^(3/2)*2^(1/2)+(2*a^2
+3*b^2)/a^2/(a^2+b^2)/d/e/(e*cot(d*x+c))^(1/2)-b^2/a/(a^2+b^2)/d/e/(a+b*cot
(d*x+c))/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 1.09, antiderivative size = 437, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3569, 3649, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)^2}-\frac{\left(a^2-2ab-b^2\right)\log\left(\sqrt{e}\cot(c+dx)+\sqrt{2}\sqrt{e\cot(c+dx)}\right.}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^2),x]
```

```
[Out] (b^(5/2)*(7*a^2 + 3*b^2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]])/(Sqrt[a]*Sqr
t[e])])/(a^(5/2)*(a^2 + b^2)^2*d*e^(3/2)) - ((a^2 + 2*a*b - b^2)*ArcTan[1 -
 (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^2*d*e^(3/2))
 + ((a^2 + 2*a*b - b^2)*ArcTan[1 + (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])
/(Sqrt[2]*(a^2 + b^2)^2*d*e^(3/2)) + (2*a^2 + 3*b^2)/(a^2*(a^2 + b^2)*d*e*S
qrt[e*Cot[c + d*x]]) - b^2/(a*(a^2 + b^2)*d*e*Sqrt[e*Cot[c + d*x]]*(a + b*C
ot[c + d*x])) + ((a^2 - 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - S
qrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d*e^(3/2)) - ((a^2 -
 2*a*b - b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d
*x]]])/(2*Sqrt[2]*(a^2 + b^2)^2*d*e^(3/2))
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
```

```
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^2}\,dx = -\frac{b^2}{a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))} - \frac{\int \frac{-\frac{1}{2}\left(2a^2+3b^2\right)e+ab}{(e\cot(c+d}}{a}$$

$$= \frac{2a^2+3b^2}{a^2\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}} - \frac{b^2}{a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b}$$

$$= \frac{2a^2+3b^2}{a^2\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}} - \frac{b^2}{a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b}$$

$$= \frac{2a^2+3b^2}{a^2\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}} - \frac{b^2}{a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b}$$

$$= \frac{2a^2+3b^2}{a^2\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}} - \frac{b^2}{a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b}$$

$$= \frac{b^{5/2}\left(7a^2+3b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{5/2}\left(a^2+b^2\right)^2 de^{3/2}} + \frac{2a^2+3b^2}{a^2\left(a^2+b^2\right)de\sqrt{e\cot(c+}}$$

$$= \frac{b^{5/2}\left(7a^2+3b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{5/2}\left(a^2+b^2\right)^2 de^{3/2}} + \frac{2a^2+3b^2}{a^2\left(a^2+b^2\right)de\sqrt{e\cot(c+}}$$

$$= \frac{b^{5/2}\left(7a^2+3b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{a^{5/2}\left(a^2+b^2\right)^2 de^{3/2}} - \frac{\left(a^2+2ab-b^2\right)\tan^{-1}\left(1-\right.}{\sqrt{2}\left(a^2+b^2\right)^2 d}$$

Mathematica [C] time = 0.63, size = 244, normalized size = 0.56

$$\frac{8a^2b^2\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-\frac{b\cot(c+dx)}{a}\right)+4b^2\left(a^2+b^2\right){}_2F_1\left(-\frac{1}{2},2;\frac{1}{2};-\frac{b\cot(c+dx)}{a}\right)+a^2\left(4\left(a^2-b^2\right){}_2F_1\left(-\frac{1}{4},1;\frac{3}{4};-\cot^2(c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^2),x]
```

```
[Out] (8*a^2*b^2*Hypergeometric2F1[-1/2, 1, 1/2, -((b*Cot[c + d*x])/a)] + 4*b^2*(
a^2 + b^2)*Hypergeometric2F1[-1/2, 2, 1/2, -((b*Cot[c + d*x])/a)] + a^2*(4*
(a^2 - b^2)*Hypergeometric2F1[-1/4, 1, 3/4, -Cot[c + d*x]^2] + Sqrt[2]*a*b*
Sqrt[Cot[c + d*x]]*(-2*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] + 2*ArcTan[1
+ Sqrt[2]*Sqrt[Cot[c + d*x]]] - Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c
+ d*x]] + Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]])))/(2*a^2*(a^2
 + b^2)^2*d*e*Sqrt[e*Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(b\cot(dx+c)+a)^2 (e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)^2*(e*cot(d*x + c))^(3/2)), x)
```

maple [B] time = 0.76, size = 803, normalized size = 1.84

$$\frac{b^3\sqrt{e\cot(dx+c)}}{de\left(a^2+b^2\right)^2 (e\cot(dx+c)\,b+ae)}+\frac{b^5\sqrt{e\cot(dx+c)}}{de\,a^2\left(a^2+b^2\right)^2 (e\cot(dx+c)\,b+ae)}+\frac{7b^3\arctan\left(\frac{\sqrt{e\cot(dx+c)}\,b}{\sqrt{aeb}}\right)}{de\left(a^2+b^2\right)^2\sqrt{aeb}}+\frac{3b^5\,\mathrm{arct}}{de\,a^2\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x)
```

```
[Out] 1/d/e*b^3/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)+1/d/e*b^5/a
^2/(a^2+b^2)^2*(e*cot(d*x+c))^(1/2)/(e*cot(d*x+c)*b+a*e)+7/d/e*b^3/(a^2+b^2
)^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+3/d/e*b^5/a^
2/(a^2+b^2)^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+1/
2/d/e^2/(a^2+b^2)^2*a*b*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*
```

```
x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))+1/d/e^2/(a^2+b^2)^2*a*b*(e^2)^(1/4)*2^(1/
2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)-1/d/e^2/(a^2+b^2)^2*a
*b*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)+
1/2/d/e/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)*a^2-1/2/d/e/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^2-1/2/d/e/(a^2+b^2)^2*2^(1/2)/(e^2)^(
1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2+1/2/d/e/(a^2+b
^2)^2*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)*b^2+1/4/d/e/(a^2+b^2)^2*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)
*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2-1/4/d/e/(a^2+b^2)^2*2^(1/2)/(e^2)^
(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)
)/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^2+
2/a^2/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.72, size = 402, normalized size = 0.92

$$e\left(\frac{4\left(2\left(a^3+ab^2\right)e+\frac{\left(2a^2b+3b^3\right)e}{\tan(dx+c)}\right)}{\left(a^5+a^3b^2\right)e^3\sqrt{\frac{e}{\tan(dx+c)}}+\left(a^4b+a^2b^3\right)e^2\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}+\frac{4\left(7a^2b^3+3b^5\right)\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^6+2a^4b^2+a^2b^4\right)\sqrt{abe}\,e^2}+\frac{2\sqrt{2}\left(a^2+2ab-b^2\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/4*e*(4*(2*(a^3 + a*b^2)*e + (2*a^2*b + 3*b^3)*e/tan(d*x + c))/((a^5 + a^3
*b^2)*e^3*sqrt(e/tan(d*x + c)) + (a^4*b + a^2*b^3)*e^2*(e/tan(d*x + c))^(3/
2)) + 4*(7*a^2*b^3 + 3*b^5)*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a^
6 + 2*a^4*b^2 + a^2*b^4)*sqrt(a*b*e)*e^2) + (2*sqrt(2)*(a^2 + 2*a*b - b^2)*
arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt
(e) + 2*sqrt(2)*(a^2 + 2*a*b - b^2)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) -
2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^2 - 2*a*b - b^2)*log(
sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2
)*(a^2 - 2*a*b - b^2)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan
(d*x + c))/sqrt(e))/((a^4 + 2*a^2*b^2 + b^4)*e^2))/d
```

mupad [B] time = 4.34, size = 15251, normalized size = 34.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(3/2)*(a + b*cot(c + d*x))^2),x)

[Out] (2/a + (b*cot(c + d*x)*(2*a^2 + 3*b^2))/(a^2*(a^2 + b^2)))/(b*d*(e*cot(c +
d*x))^(3/2) + a*d*e*(e*cot(c + d*x))^(1/2)) - atan((((e*cot(c + d*x))^(1/2)
*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^1
3 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*
e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*
e^13 + 32*a^32*b^5*d^5*e^13) + (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^
2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(26496*a^25*b^14*d
^6*e^15 - 1152*a^15*b^24*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^
20*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 - ((e*cot(
c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056
*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16
 + 443136*a^25*b^16*d^7*e^16 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12
*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^
6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*a^39*b^2*d^7*e^16) + (1i/(4*(a^4*d^
2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e
^3)))^(1/2)*(768*a^16*b^27*d^8*e^18 - (e*cot(c + d*x))^(1/2)*(1i/(4*(a^4*d^
2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e
^3)))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*
b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584
*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 -
 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19
 - 512*a^42*b^3*d^9*e^19) + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e
^18 + 133120*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b
^17*d^8*e^18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 4992
0*a^32*b^11*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4
096*a^38*b^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18))*(1i/(4*(a^4*d^2*e^3 + b^4*d
^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2) +
 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376*a^31*b^8*d^6*e^
15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^37*b^2*d^6*e^15)
)*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i -
 6*a^2*b^2*d^2*e^3)))^(1/2)*1i + ((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5
*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*
d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^
11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*
d^5*e^13) - (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^
2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(((e*cot(c + d*x))^(1/2)*(1152*a^15*b
^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752
*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16
 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*
d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^
7*e^16 + 64*a^39*b^2*d^7*e^16) - (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*
d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*((e*cot(c + d*x)
)^(1/2)*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^
```

3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19) + 768*a^16*b^27*d^8*e^18 + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 + 133120*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^8*e^18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32*b^11*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^38*b^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2) - 1152*a^15*b^24*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^20*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 + 26496*a^25*b^14*d^6*e^15 + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376*a^31*b^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^37*b^2*d^6*e^15))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*1i)/(((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13) + (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(26496*a^25*b^14*d^6*e^15 - 1152*a^15*b^24*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^20*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 - ((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*a^39*b^2*d^7*e^16) + (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(768*a^16*b^27*d^8*e^18 - (e*cot(c + d*x))^(1/2)*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19) + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 + 133120*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^8*e^18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32*b^11*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^38*b^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2) + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376*a^31*b^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^37*b^2*d^6*e^15))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2) - ((e*cot(

c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13) - (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*a^39*b^2*d^7*e^16) - (1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*((e*cot(c + d*x))^(1/2)*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19) + 768*a^16*b^27*d^8*e^18 + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 + 133120*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^8*e^18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32*b^11*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^38*b^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2) - 1152*a^15*b^24*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^20*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 + 26496*a^25*b^14*d^6*e^15 + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376*a^31*b^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^37*b^2*d^6*e^15))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2) + 144*a^14*b^21*d^4*e^12 + 1296*a^16*b^19*d^4*e^12 + 4880*a^18*b^17*d^4*e^12 + 10000*a^20*b^15*d^4*e^12 + 12080*a^22*b^13*d^4*e^12 + 8624*a^24*b^11*d^4*e^12 + 3376*a^26*b^9*d^4*e^12 + 560*a^28*b^7*d^4*e^12))*(1i/(4*(a^4*d^2*e^3 + b^4*d^2*e^3 + a*b^3*d^2*e^3*4i - a^3*b*d^2*e^3*4i - 6*a^2*b^2*d^2*e^3)))^(1/2)*2i - atan(((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13))/2 + ((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(13248*a^25*b^14*d^6*e^15 - 576*a^15*b^24*d^6*e^15 - 4224*a^17*b^22*d^6*e^15 - 11888*a^19*b^20*d^6*e^15 - 14832*a^21*b^18*d^6*e^15 - 3264*a^23*b^16*d^6*e^15 - ((((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(384*a^16*b^27*d^8*e^18 - ((e*cot(c + d*x))^(1/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(512*a^18*b^

27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^
24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67
584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19
 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19
))/4 + 4352*a^18*b^25*d^8*e^18 + 22144*a^20*b^23*d^8*e^18 + 66560*a^22*b^21
*d^8*e^18 + 130560*a^24*b^19*d^8*e^18 + 173568*a^26*b^17*d^8*e^18 + 155904*
a^28*b^15*d^8*e^18 + 89088*a^30*b^13*d^8*e^18 + 24960*a^32*b^11*d^8*e^18 -
3840*a^34*b^9*d^8*e^18 - 6016*a^36*b^7*d^8*e^18 - 2048*a^38*b^5*d^8*e^18 -
256*a^40*b^3*d^8*e^18))/2 + ((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^1
6 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*
d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a
^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 +
3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64
*a^39*b^2*d^7*e^16))/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e
^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2))/2 + 16992*a^27*b^12*d^6*
e^15 + 9312*a^29*b^10*d^6*e^15 + 2688*a^31*b^8*d^6*e^15 + 576*a^33*b^6*d^6*
e^15 + 144*a^35*b^4*d^6*e^15 + 16*a^37*b^2*d^6*e^15))/2)*1i + (1/(a^4*d^2*e
^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^
3*6i))^(1/2)*(((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b
^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^2
2*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*
a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13))/2 - ((1/
(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*
b^2*d^2*e^3*6i))^(1/2)*(13248*a^25*b^14*d^6*e^15 - 576*a^15*b^24*d^6*e^15 -
 4224*a^17*b^22*d^6*e^15 - 11888*a^19*b^20*d^6*e^15 - 14832*a^21*b^18*d^6*e
^15 - 3264*a^23*b^16*d^6*e^15 - ((((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*
a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(((e*cot(c + d
x))^(1/2)(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*
d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^
25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a
^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 8
4480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19
 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19))/4 + 384*a^16*b^27*d^8*e
^18 + 4352*a^18*b^25*d^8*e^18 + 22144*a^20*b^23*d^8*e^18 + 66560*a^22*b^21*
d^8*e^18 + 130560*a^24*b^19*d^8*e^18 + 173568*a^26*b^17*d^8*e^18 + 155904*a
^28*b^15*d^8*e^18 + 89088*a^30*b^13*d^8*e^18 + 24960*a^32*b^11*d^8*e^18 - 3
840*a^34*b^9*d^8*e^18 - 6016*a^36*b^7*d^8*e^18 - 2048*a^38*b^5*d^8*e^18 - 2
56*a^40*b^3*d^8*e^18))/2 - ((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16
 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d
^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a^
27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3
200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*
a^39*b^2*d^7*e^16))/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^
3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2))/2 + 16992*a^27*b^12*d^6*e
^15 + 9312*a^29*b^10*d^6*e^15 + 2688*a^31*b^8*d^6*e^15 + 576*a^33*b^6*d^6*e

^15 + 144*a^35*b^4*d^6*e^15 + 16*a^37*b^2*d^6*e^15))/2)*1i)/((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13))/2 + ((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(13248*a^25*b^14*d^6*e^15 - 576*a^15*b^24*d^6*e^15 - 4224*a^17*b^22*d^6*e^15 - 11888*a^19*b^20*d^6*e^15 - 14832*a^21*b^18*d^6*e^15 - 3264*a^23*b^16*d^6*e^15 - ((((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(384*a^16*b^27*d^8*e^18 - ((e*cot(c + d*x))^(1/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19))/4 + 4352*a^18*b^25*d^8*e^18 + 22144*a^20*b^23*d^8*e^18 + 66560*a^22*b^21*d^8*e^18 + 130560*a^24*b^19*d^8*e^18 + 173568*a^26*b^17*d^8*e^18 + 155904*a^28*b^15*d^8*e^18 + 89088*a^30*b^13*d^8*e^18 + 24960*a^32*b^11*d^8*e^18 - 3840*a^34*b^9*d^8*e^18 - 6016*a^36*b^7*d^8*e^18 - 2048*a^38*b^5*d^8*e^18 - 256*a^40*b^3*d^8*e^18))/2 + ((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*a^39*b^2*d^7*e^16))/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2))/2 + 16992*a^27*b^12*d^6*e^15 + 9312*a^29*b^10*d^6*e^15 + 2688*a^31*b^8*d^6*e^15 + 576*a^33*b^6*d^6*e^15 + 144*a^35*b^4*d^6*e^15 + 16*a^37*b^2*d^6*e^15))/2) - (1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13))/2 - ((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(13248*a^25*b^14*d^6*e^15 - 576*a^15*b^24*d^6*e^15 - 4224*a^17*b^22*d^6*e^15 - 11888*a^19*b^20*d^6*e^15 - 14832*a^21*b^18*d^6*e^15 - 3264*a^23*b^16*d^6*e^15 - ((((1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(((e*cot(c + d*x))^(1/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 51

20*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19))/4 + 384*a^16*b^27*d^8*e^18 + 4352*a^18*b^25*d^8*e^18 + 22144*a^20*b^23*d^8*e^18 + 66560*a^22*b^21*d^8*e^18 + 130560*a^24*b^19*d^8*e^18 + 173568*a^26*b^17*d^8*e^18 + 155904*a^28*b^15*d^8*e^18 + 89088*a^30*b^13*d^8*e^18 + 24960*a^32*b^11*d^8*e^18 - 3840*a^34*b^9*d^8*e^18 - 6016*a^36*b^7*d^8*e^18 - 2048*a^38*b^5*d^8*e^18 - 256*a^40*b^3*d^8*e^18))/2 - ((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*a^39*b^2*d^7*e^16))/2)*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2))/2 + 16992*a^27*b^12*d^6*e^15 + 9312*a^29*b^10*d^6*e^15 + 2688*a^31*b^8*d^6*e^15 + 576*a^33*b^6*d^6*e^15 + 144*a^35*b^4*d^6*e^15 + 16*a^37*b^2*d^6*e^15))/2) + 144*a^14*b^21*d^4*e^12 + 1296*a^16*b^19*d^4*e^12 + 4880*a^18*b^17*d^4*e^12 + 10000*a^20*b^15*d^4*e^12 + 12080*a^22*b^13*d^4*e^12 + 8624*a^24*b^11*d^4*e^12 + 3376*a^26*b^9*d^4*e^12 + 560*a^28*b^7*d^4*e^12))*(1/(a^4*d^2*e^3*1i + b^4*d^2*e^3*1i + 4*a*b^3*d^2*e^3 - 4*a^3*b*d^2*e^3 - a^2*b^2*d^2*e^3*6i))^(1/2)*1i - (atan(((((e*cot(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13) + ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*(26496*a^25*b^14*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^20*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 - 1152*a^15*b^24*d^6*e^15 + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376*a^31*b^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^37*b^2*d^6*e^15 - ((7*a^2 + 3*b^2)*((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64*a^39*b^2*d^7*e^16) + ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*(768*a^16*b^27*d^8*e^18 + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 + 133120*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^8*e^18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32*b^11*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^38*b^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18 - ((e*cot(c + d*x))^(1/2)*(7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3))))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(-a^5*b^5*e^3)^(1/2))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3))))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(7*a^2 + 3*b^2)*(-a^5*b^5

*e^3)^(1/2)*1i)/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)) + (((e*co
t(c + d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*
a^18*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 28
16*a^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 -
560*a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13) - ((7*a^2 + 3*b^2)*(-a^5*b^5*
e^3)^(1/2)*(26496*a^25*b^14*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19
*b^20*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 - 1152*
a^15*b^24*d^6*e^15 + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 +
5376*a^31*b^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 3
2*a^37*b^2*d^6*e^15 + ((7*a^2 + 3*b^2)*((e*cot(c + d*x))^(1/2)*(1152*a^15*b
^26*d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752
*a^21*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16
 + 337792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*
d^7*e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^
7*e^16 + 64*a^39*b^2*d^7*e^16) - ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*(768
*a^16*b^27*d^8*e^18 + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 +
133120*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^
8*e^18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32
*b^11*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^
38*b^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18 + ((e*cot(c + d*x))^(1/2)*(7*a^2 +
3*b^2)*(-a^5*b^5*e^3)^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^
19 + 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*
d^9*e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34
*b^11*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a
^40*b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 +
2*a^7*b^2*d*e^3))))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(-a^
5*b^5*e^3)^(1/2))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3))))/(2*(a
^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(7*a^2 + 3*b^2)*(-a^5*b^5*e^3
)^(1/2)*1i)/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))/((((e*cot(c
+ d*x))^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18
*b^19*d^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a
^24*b^13*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*
a^30*b^7*d^5*e^13 + 32*a^32*b^5*d^5*e^13) + ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)
^(1/2)*(26496*a^25*b^14*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^2
0*d^6*e^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 - 1152*a^15
*b^24*d^6*e^15 + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376
*a^31*b^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^
37*b^2*d^6*e^15 - ((7*a^2 + 3*b^2)*((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*
d^7*e^16 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^2
1*b^20*d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 3
37792*a^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*
e^16 + 3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^
16 + 64*a^39*b^2*d^7*e^16) + ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*(768*a^1
6*b^27*d^8*e^18 + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 + 1331
20*a^22*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^8*e^

18 + 311808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32*b^1
1*d^8*e^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^38*b
^5*d^8*e^18 - 512*a^40*b^3*d^8*e^18 - ((e*cot(c + d*x))^(1/2)*(7*a^2 + 3*b^
2)*(-a^5*b^5*e^3)^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 +
 22528*a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*
e^19 + 67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^1
1*d^9*e^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*
b^5*d^9*e^19 - 512*a^42*b^3*d^9*e^19))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^
7*b^2*d*e^3))))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(-a^5*b^
5*e^3)^(1/2))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3))))/(2*(a^9*d
*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1
/2))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)) - (((e*cot(c + d*x))
^(1/2)*(144*a^14*b^23*d^5*e^13 + 1248*a^16*b^21*d^5*e^13 + 4224*a^18*b^19*d
^5*e^13 + 6720*a^20*b^17*d^5*e^13 + 3872*a^22*b^15*d^5*e^13 - 2816*a^24*b^1
3*d^5*e^13 - 5632*a^26*b^11*d^5*e^13 - 3136*a^28*b^9*d^5*e^13 - 560*a^30*b^
7*d^5*e^13 + 32*a^32*b^5*d^5*e^13) - ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*
(26496*a^25*b^14*d^6*e^15 - 8448*a^17*b^22*d^6*e^15 - 23776*a^19*b^20*d^6*e
^15 - 29664*a^21*b^18*d^6*e^15 - 6528*a^23*b^16*d^6*e^15 - 1152*a^15*b^24*d
^6*e^15 + 33984*a^27*b^12*d^6*e^15 + 18624*a^29*b^10*d^6*e^15 + 5376*a^31*b
^8*d^6*e^15 + 1152*a^33*b^6*d^6*e^15 + 288*a^35*b^4*d^6*e^15 + 32*a^37*b^2*
d^6*e^15 + ((7*a^2 + 3*b^2)*((e*cot(c + d*x))^(1/2)*(1152*a^15*b^26*d^7*e^1
6 + 13440*a^17*b^24*d^7*e^16 + 69056*a^19*b^22*d^7*e^16 + 202752*a^21*b^20*
d^7*e^16 + 372800*a^23*b^18*d^7*e^16 + 443136*a^25*b^16*d^7*e^16 + 337792*a
^27*b^14*d^7*e^16 + 156160*a^29*b^12*d^7*e^16 + 37632*a^31*b^10*d^7*e^16 +
3200*a^33*b^8*d^7*e^16 + 704*a^35*b^6*d^7*e^16 + 512*a^37*b^4*d^7*e^16 + 64
*a^39*b^2*d^7*e^16) - ((7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*(768*a^16*b^27*
d^8*e^18 + 8704*a^18*b^25*d^8*e^18 + 44288*a^20*b^23*d^8*e^18 + 133120*a^22
*b^21*d^8*e^18 + 261120*a^24*b^19*d^8*e^18 + 347136*a^26*b^17*d^8*e^18 + 31
1808*a^28*b^15*d^8*e^18 + 178176*a^30*b^13*d^8*e^18 + 49920*a^32*b^11*d^8*e
^18 - 7680*a^34*b^9*d^8*e^18 - 12032*a^36*b^7*d^8*e^18 - 4096*a^38*b^5*d^8*
e^18 - 512*a^40*b^3*d^8*e^18 + ((e*cot(c + d*x))^(1/2)*(7*a^2 + 3*b^2)*(-a^
5*b^5*e^3)^(1/2)*(512*a^18*b^27*d^9*e^19 + 5120*a^20*b^25*d^9*e^19 + 22528*
a^22*b^23*d^9*e^19 + 56320*a^24*b^21*d^9*e^19 + 84480*a^26*b^19*d^9*e^19 +
67584*a^28*b^17*d^9*e^19 - 67584*a^32*b^13*d^9*e^19 - 84480*a^34*b^11*d^9*e
^19 - 56320*a^36*b^9*d^9*e^19 - 22528*a^38*b^7*d^9*e^19 - 5120*a^40*b^5*d^9
*e^19 - 512*a^42*b^3*d^9*e^19))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d
e^3))))/(2(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(-a^5*b^5*e^3)^
(1/2))/(2*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3))))/(2*(a^9*d*e^3 +
a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)))*(7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2))/(2
*(a^9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)) + 144*a^14*b^21*d^4*e^12 +
1296*a^16*b^19*d^4*e^12 + 4880*a^18*b^17*d^4*e^12 + 10000*a^20*b^15*d^4*e^1
2 + 12080*a^22*b^13*d^4*e^12 + 8624*a^24*b^11*d^4*e^12 + 3376*a^26*b^9*d^4*
e^12 + 560*a^28*b^7*d^4*e^12))*(7*a^2 + 3*b^2)*(-a^5*b^5*e^3)^(1/2)*1i)/(a^
9*d*e^3 + a^5*b^4*d*e^3 + 2*a^7*b^2*d*e^3)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\left(a+b\cot\left(c+dx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(3/2)/(a+b*cot(d*x+c))**2,x)
[Out] Integral(1/((e*cot(c + d*x))**(3/2)*(a + b*cot(c + d*x))**2), x)
```

3.81 $\int \frac{(e\cot(c+dx))^{9/2}}{(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=529

$$-\frac{e^{9/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^3}+\frac{e^{9/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\right.}{2\sqrt{2}\,d}$$

```
[Out] 1/4*a^(5/2)*(15*a^4+46*a^2*b^2+63*b^4)*e^(9/2)*arctan(b^(1/2)*(e*cot(d*x+c)
)^(1/2)/a^(1/2)/e^(1/2))/b^(7/2)/(a^2+b^2)^3/d+1/2*a^2*e^2*(e*cot(d*x+c))^(
5/2)/b/(a^2+b^2)/d/(a+b*cot(d*x+c))^2+1/4*a^2*(5*a^2+13*b^2)*e^3*(e*cot(d*x
+c))^(3/2)/b^2/(a^2+b^2)^2/d/(a+b*cot(d*x+c))+1/2*(a-b)*(a^2+4*a*b+b^2)*e^(
9/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1
/2*(a-b)*(a^2+4*a*b+b^2)*e^(9/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1
/2))/(a^2+b^2)^3/d*2^(1/2)-1/4*(a+b)*(a^2-4*a*b+b^2)*e^(9/2)*ln(e^(1/2)+cot
(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^3/d*2^(1/2)+1/4*(a+
b)*(a^2-4*a*b+b^2)*e^(9/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x
+c))^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1/4*(15*a^4+31*a^2*b^2+8*b^4)*e^4*(e*cot(
d*x+c))^(1/2)/b^3/(a^2+b^2)^2/d
```

Rubi [A] time = 1.63, antiderivative size = 529, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {3565, 3645, 3647, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{e^4\left(31a^2b^2+15a^4+8b^4\right)\sqrt{e\cot(c+dx)}}{4b^3d\left(a^2+b^2\right)^2}+\frac{a^2e^3\left(5a^2+13b^2\right)(e\cot(c+dx))^{3/2}}{4b^2d\left(a^2+b^2\right)^2(a+b\cot(c+dx))}+\frac{a^2e^2(e\cot(c+dx))^{5/2}}{2bd\left(a^2+b^2\right)(a+b\cot(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(9/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] (a^(5/2)*(15*a^4 + 46*a^2*b^2 + 63*b^4)*e^(9/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[
c + d*x]])/(Sqrt[a]*Sqrt[e])]])/(4*b^(7/2)*(a^2 + b^2)^3*d) + ((a - b)*(a^2
+ 4*a*b + b^2)*e^(9/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/
(Sqrt[2]*(a^2 + b^2)^3*d) - ((a - b)*(a^2 + 4*a*b + b^2)*e^(9/2)*ArcTan[1 +
 (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d) - ((15*
a^4 + 31*a^2*b^2 + 8*b^4)*e^4*Sqrt[e*Cot[c + d*x]])/(4*b^3*(a^2 + b^2)^2*d)
 + (a^2*e^2*(e*Cot[c + d*x])^(5/2))/(2*b*(a^2 + b^2)*d*(a + b*Cot[c + d*x])
^2) + (a^2*(5*a^2 + 13*b^2)*e^3*(e*Cot[c + d*x])^(3/2))/(4*b^2*(a^2 + b^2)^
2*d*(a + b*Cot[c + d*x])) - ((a + b)*(a^2 - 4*a*b + b^2)*e^(9/2)*Log[Sqrt[e
] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 +
```

```
 b^2)^3*d) + ((a + b)*(a^2 - 4*a*b + b^2)*e^(9/2)*Log[Sqrt[e] + Sqrt[e]*Cot
[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3645

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*d^2 + c*(c*C - B*d))*(a + b*Tan[e
+ f*x])^m*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dis
t[1/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 1)*(c + d*Tan[e
```

```
+ f*x])^(n + 1)*Simp[A*d*(b*d*m - a*c*(n + 1)) + (c*C - B*d)*(b*c*m + a*d*(
n + 1)) - d*(n + 1)*((A - C)*(b*c - a*d) + B*(a*c + b*d))*Tan[e + f*x] - b*
(d*(B*c - A*d)*(m + n + 1) - C*(c^2*m - d^2*(n + 1)))*Tan[e + f*x]^2, x], x
], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[
a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3647

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.
) + (f_.)*(x_)]^2), x_Symbol] :> Simp[(C*(a + b*Tan[e + f*x])^m*(c + d*Tan[
e + f*x])^(n + 1))/(d*f*(m + n + 1)), x] + Dist[1/(d*(m + n + 1)), Int[(a +
 b*Tan[e + f*x])^(m - 1)*(c + d*Tan[e + f*x])^n*Simp[a*A*d*(m + n + 1) - C*
(b*c*m + a*d*(n + 1)) + d*(A*b + a*B - b*C)*(m + n + 1)*Tan[e + f*x] - (C*m
*(b*c - a*d) - b*B*d*(m + n + 1))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b
, c, d, e, f, A, B, C, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] &&
NeQ[c^2 + d^2, 0] && GtQ[m, 0] &&  !(IGtQ[n, 0] && ( !IntegerQ[m] || (EqQ[c
, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{9/2}}{(a+b\cot(c+dx))^3}\,dx = \frac{a^2e^2(e\cot(c+dx))^{5/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\int \frac{(e\cot(c+dx))^{3/2}\left(-\frac{5}{2}a^2e^3+2abe^3\cot(c+dx)-\frac{1}{2}\left(5a^2+4b^2\right)e^3\cot}{(a+b\cot(c+dx))^2}}{2b\left(a^2+b^2\right)}$$

$$= \frac{a^2e^2(e\cot(c+dx))^{5/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2\left(5a^2+13b^2\right)e^3(e\cot(c+dx))^{3/2}}{4b^2\left(a^2+b^2\right)^2d(a+b\cot(c+dx))} + \frac{\int \frac{\sqrt{e\cot(c+}}{}}{}$$

$$= -\frac{\left(15a^4+31a^2b^2+8b^4\right)e^4\sqrt{e\cot(c+dx)}}{4b^3\left(a^2+b^2\right)^2d} + \frac{a^2e^2(e\cot(c+dx))^{5/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2}{4b^2}$$

$$= -\frac{\left(15a^4+31a^2b^2+8b^4\right)e^4\sqrt{e\cot(c+dx)}}{4b^3\left(a^2+b^2\right)^2d} + \frac{a^2e^2(e\cot(c+dx))^{5/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2}{4b^2}$$

$$= -\frac{\left(15a^4+31a^2b^2+8b^4\right)e^4\sqrt{e\cot(c+dx)}}{4b^3\left(a^2+b^2\right)^2d} + \frac{a^2e^2(e\cot(c+dx))^{5/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2}{4b^2}$$

$$= -\frac{\left(15a^4+31a^2b^2+8b^4\right)e^4\sqrt{e\cot(c+dx)}}{4b^3\left(a^2+b^2\right)^2d} + \frac{a^2e^2(e\cot(c+dx))^{5/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2}{4b^2}$$

$$= \frac{a^{5/2}\left(15a^4+46a^2b^2+63b^4\right)e^{9/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{7/2}\left(a^2+b^2\right)^3d} - \frac{\left(15a^4+31a^2b^2+8b^4\right)e^4\sqrt{e}}{4b^3\left(a^2+b^2\right)^2d}$$

$$= \frac{a^{5/2}\left(15a^4+46a^2b^2+63b^4\right)e^{9/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{7/2}\left(a^2+b^2\right)^3d} - \frac{\left(15a^4+31a^2b^2+8b^4\right)e^4\sqrt{e}}{4b^3\left(a^2+b^2\right)^2d}$$

$$= \frac{a^{5/2}\left(15a^4+46a^2b^2+63b^4\right)e^{9/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{7/2}\left(a^2+b^2\right)^3d} + \frac{(a-b)\left(a^2+4ab+b^2\right)e^{9/2}}{\sqrt{2}\left(a^2+\right.}$$

Mathematica [C] time = 6.26, size = 556, normalized size = 1.05

$$-\frac{(e\cot(c+dx))^{9/2}\left(\frac{4b^2\cot^{\frac{11}{2}}(c+dx)\,{}_2F_1\left(2,\frac{11}{2};\frac{13}{2};-\frac{b\cot(c+dx)}{a}\right)}{11a\left(a^2+b^2\right)^2}-\frac{2a\left(a^2-3b^2\right)\left(-7\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-3\cot^{\frac{7}{2}}(c+dx)+7\cot^{\frac{3}{2}}\right.}{21\left(a^2+b^2\right)^3}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cot[c + d*x])^(9/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(((e*Cot[c + d*x])^(9/2)*((2*b*(3*a^2 - b^2)*Cot[c + d*x]^(9/2))/(9*(a^2 +
 b^2)^3) - (2*a*(3*a^2 - b^2)*(15*Cot[c + d*x]^(7/2) - 7*a*((3*Cot[c + d*x]
^(5/2))/b - (5*a*((-3*a*(-((Sqrt[a]*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqr
t[a]])/b^(3/2)) + Sqrt[Cot[c + d*x]]/b))/b + Cot[c + d*x]^(3/2)/b))/b)))/(1
05*(a^2 + b^2)^3) - (2*a*(a^2 - 3*b^2)*(7*Cot[c + d*x]^(3/2) - 3*Cot[c + d*
x]^(7/2) - 7*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x
]^2]))/(21*(a^2 + b^2)^3) + (4*b^2*Cot[c + d*x]^(11/2)*Hypergeometric2F1[2,
 11/2, 13/2, -((b*Cot[c + d*x])/a)])/(11*a*(a^2 + b^2)^2) + (2*b^2*Cot[c +
d*x]^(11/2)*Hypergeometric2F1[3, 11/2, 13/2, -((b*Cot[c + d*x])/a)])/(11*a^
3*(a^2 + b^2)) - (b*(3*a^2 - b^2)*(360*Sqrt[Cot[c + d*x]] - 72*Cot[c + d*x]
^(5/2) + 40*Cot[c + d*x]^(9/2) + 45*(2*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot
[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]) + Sqrt[2]*Log
[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*S
```

```
qrt[Cot[c + d*x]] + Cot[c + d*x]])))/(180*(a^2 + b^2)^3)))/(d*Cot[c + d*x]^
(9/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(9/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{9}{2}}}{(b\cot(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(9/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(9/2)/(b*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.85, size = 1254, normalized size = 2.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(9/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] -2/d*e^4/b^3*(e*cot(d*x+c))^(1/2)-9/4/d*e^5*a^7/b^2/(a^2+b^2)^3/(e*cot(d*x+
c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)-13/2/d*e^5*a^5/(a^2+b^2)^3/(e*cot(d*x+c)*b
+a*e)^2*(e*cot(d*x+c))^(3/2)-17/4/d*e^5*a^3*b^2/(a^2+b^2)^3/(e*cot(d*x+c)*b
+a*e)^2*(e*cot(d*x+c))^(3/2)-7/4/d*e^6*a^8/b^3/(a^2+b^2)^3/(e*cot(d*x+c)*b+
a*e)^2*(e*cot(d*x+c))^(1/2)-11/2/d*e^6*a^6/b/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*
e)^2*(e*cot(d*x+c))^(1/2)-15/4/d*e^6*a^4*b/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)
^2*(e*cot(d*x+c))^(1/2)+15/4/d*e^5*a^7/b^3/(a^2+b^2)^3/(a*e*b)^(1/2)*arctan
((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+23/2/d*e^5*a^5/b/(a^2+b^2)^3/(a*e*b)
^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+63/4/d*e^5*a^3*b/(a^2+b
^2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-3/2/d*e^4/
(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)+1)*a^2*b+1/2/d*e^4/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+3/2/d*e^4/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/
2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d*e^4/(a^2
+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
```

```
)+1)*b^3-3/4/d*e^4/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(
1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e
*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b+1/4/d*e^4/(a^2+b^2)^3*(e^2)^
(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2
)))*b^3-1/2/d*e^5/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e^5/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arc
tan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2-1/4/d*e^5/(a^2+b^2)^3
*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1
/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^
2)^(1/2)))*a^3+3/4/d*e^5/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2+1/2/d*e^5/(a^2+b^2)^3*
2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3
-3/2/d*e^5/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)*a*b^2
```

maxima [A] time = 0.61, size = 537, normalized size = 1.02

$$\left(\frac{\left(15\,a^{7}+46\,a^{5}b^{2}+63\,a^{3}b^{4}\right)e^{4}\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{6}b^{3}+3\,a^{4}b^{5}+3\,a^{2}b^{7}+b^{9}\right)\sqrt{abe}}-\frac{\left(\frac{2\,\sqrt{2}\left(a^{3}+3\,a^{2}b-3\,ab^{2}-b^{3}\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^{3}+3\,a^{2}b-3\,ab^{2}-b^{3}\right)\arctan\left(-\frac{\sqrt{2}\cdots}{\cdots}\right)}{\sqrt{e}}\cdots\right)}{\cdots}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(9/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/4*((15*a^7 + 46*a^5*b^2 + 63*a^3*b^4)*e^4*arctan(b*sqrt(e/tan(d*x + c))/s
qrt(a*b*e))/((a^6*b^3 + 3*a^4*b^5 + 3*a^2*b^7 + b^9)*sqrt(a*b*e)) - (2*sqrt
(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2
*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^
2 - b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqr
t(e))/sqrt(e) - sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(sqrt(2)*sqrt(e)
*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*
b - 3*a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*
x + c))/sqrt(e))*e^4/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) - 8*e^3*sqrt(e/tan
(d*x + c))/b^3 - ((7*a^6 + 15*a^4*b^2)*e^5*sqrt(e/tan(d*x + c)) + (9*a^5*b
```

```
+ 17*a^3*b^3)*e^4*(e/tan(d*x + c))^(3/2))/((a^6*b^3 + 2*a^4*b^5 + a^2*b^7)*
e^2 + 2*(a^5*b^4 + 2*a^3*b^6 + a*b^8)*e^2/tan(d*x + c) + (a^4*b^5 + 2*a^2*b
^7 + b^9)*e^2/tan(d*x + c)^2))*e/d
```

mupad [B] time = 10.40, size = 20651, normalized size = 39.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(9/2)/(a + b*cot(c + d*x))^3,x)
```

```
[Out] atan(((((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^
4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b
^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 4800
0*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^
21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d
^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) +
((e*cot(c + d*x))^(1/2)*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a
^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(5
12*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400
*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 2
1504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^
10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*
e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*
a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b
^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 1
5*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x
))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e
^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^
2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^1
5*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240
*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*
b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^
7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^
5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (
2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 109
74*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24
 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^
24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5
+ 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 +
8*a^14*b^7*d^5 + a^16*b^5*d^5))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^
2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^
(1/2) + ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^1
6*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 268
01*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e
```

^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*1i - (((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) - ((e*cot(c + d*x))^(1/2)*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*1i)/((225*a^15*e^33 + 504*a^3*b^12*e^33 + 872*a^5*b^10*e^33 + 4457*a^7*b^8*e^33 + 5916*a^9*b^6*e^33 + 4006*a^11*b^4*e^33 + 1380*a^13*b^2*e^33)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 +

8*a^14*b^7*d^5 + a^16*b^5*d^5) + (((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) + ((e*cot(c + d*x))^(1/2)*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) - ((e*cot(c + d*x))^(1/2)*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*

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6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1
/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 +
 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^
10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*
d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^
8*d^4*e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4
 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 +
a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*
6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c
 + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21
*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b
^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 4554
72*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 +
 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 5
6*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a
^14*b^7*d^4 + a^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6
i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/
2) + (2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24
 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^
2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*
d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^1
7*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*
d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*
b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d
^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a
^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28
 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16
*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4
+ 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a
^16*b^5*d^4))*(-(e^9*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6
i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)))*(-(e^9*1i)
/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3
*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*2i - (((e*cot(c + d*x))^(1/2)*(7*a^6
*e^6 + 15*a^4*b^2*e^6))/(4*(a^4 + b^4 + 2*a^2*b^2)) + (b*(e*cot(c + d*x))^(
3/2)*(9*a^5*e^5 + 17*a^3*b^2*e^5))/(4*(a^4 + b^4 + 2*a^2*b^2)))/(a^2*b^3*d*
e^2 + b^5*d*e^2*cot(c + d*x)^2 + 2*a*b^4*d*e^2*cot(c + d*x)) + atan((((((1
28*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 883
20*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15
 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*
d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a
^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10
*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) + ((e*cot(c +
d*x))^(1/2)*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 -
 a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^30*d^4*
e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*d^
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4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i - (((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) - ((e*cot(c + d*x))^(1/2)*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19

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- 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 +
46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e
^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^
7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4
+ 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56
*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4
*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 2
0*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (2250*a^20*b*d^2*e^24 + 32*a^2*b
^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a
^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 35
78*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(
b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13
*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5))
*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^
2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)
*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 38
41*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b
^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^
4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4
+ 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i -
a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 +
 a^4*b^2*d^2*15i)))^(1/2)*1i)/((225*a^15*e^33 + 504*a^3*b^12*e^33 + 872*a^5
*b^10*e^33 + 4457*a^7*b^8*e^33 + 5916*a^9*b^6*e^33 + 4006*a^11*b^4*e^33 + 1
380*a^13*b^2*e^33)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^
15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*
d^5 + a^16*b^5*d^5) + (((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 2
5536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15
 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12
*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b
^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5
 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 +
a^16*b^5*d^5) + ((e*cot(c + d*x))^(1/2)*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i +
 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2
*15i)))^(1/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*
d^4*e^10 + 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b
^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*
a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 5
12*a^22*b^8*d^4*e^10))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^
6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*
b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 +
6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) -
 ((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 102
4*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 17
7344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e
^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*
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d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^
17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9
*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i +
6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*
15i)))^(1/2) + (2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^1
7*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^
10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210
*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 +
28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28
*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5))*(-e^9/(4*(b^6*d^2*1i - a^6*
d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4
*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^
28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8
*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28
 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6
*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b
^7*d^4 + a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6
*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) +
(((((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15
 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^
4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17
*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5
 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 5
6*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) - ((e*co
t(c + d*x))^(1/2)*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b
*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^3
0*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b
^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a
^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 1
7920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))
/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^
13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4
))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*
d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/
2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 +
8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19
 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*
d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*
b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d
^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4
+ a^16*b^5*d^4))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*
d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (2250*a
^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6
*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 853
14*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 1
```

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1550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a
^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14
*b^7*d^5 + a^16*b^5*d^5))*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 +
 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)
- ((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28
 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^1
0*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/
(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^1
3*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4)
)*(-e^9/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d
^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)))*(-e^9/(4*(b^6*d^2*1i -
 a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2
+ a^4*b^2*d^2*15i)))^(1/2)*2i - (2*e^4*(e*cot(c + d*x))^(1/2))/(b^3*d) + (a
tan((((((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16
*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 2680
1*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^
28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^
8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5
*d^4) - (((2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2
*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^
11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16
*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^
4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12
*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) + ((((e*cot(c + d*x))^(1/2)*(1800
*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5
*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 40291
2*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19
 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*
e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*
a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b
^5*d^4) + (((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*
d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11
*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48
000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(
b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13
*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5)
- ((e*cot(c + d*x))^(1/2)*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/
2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 +
38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^1
0 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d
^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8
*d^4*e^10))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)*(b^21*d^4
+ 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56
*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4)))*(15*a^4
 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3
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*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2)*1i)/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)) + ((((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4) + (((2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) - ((((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4) - (((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) + ((e*cot(c + d*x))^(1/2)*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)*(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2)*1i)/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))/((225*a^15*e^33 + 504*a^3*b^12*e^33 + 872*a^5*b^10*e^33 + 4457*a^7*b^8*e^33 + 5916*a^9*b^6*e^33 + 4006*a^11*b^4*e^33 + 1380*a^13*b^2*e^33)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5

+ a^16*b^5*d^5) - ((((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4) - (((2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 + 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) + ((((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^19 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19 + 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4) + (((128*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 88320*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15 + 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) - ((e*cot(c + d*x))^(1/2)*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2)*(512*b^30*d^4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)*(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)) + ((((e*cot(c + d*x))^(1/2)*(32*b^18*e^28 - 225*a^18*e^28 + 128*a^2*b^16*e^28 + 192*a^4*b^14*e^28 - 3841*a^6*b^12*e^28 + 18050*a^8*b^10*e^28 + 26801*a^10*b^8*e^28 + 16860*a^12*b^6*e^28 + 4049*a^14*b^4*e^28 - 30*a^16*b^2*e^28))/(b^21*d^4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4) + (((2250*a^20*b*d^2*e^24 + 32*a^2*b^19*d^2*e^24 + 12288*a^4*b^17*d^2*e^24 - 10974*a^6*b^15*d^2*e^24 - 105162*a^8*b^13*d^2*e^24 - 150758*a^10*b^11*d^2*e^24 - 85314*a^12*b^9*d^2*e^24 - 3578*a^14*b^7*d^2*e^24 + 22210*a^16*b^5*d^2*e^24 +

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 11550*a^18*b^3*d^2*e^24)/(b^21*d^5 + 8*a^2*b^19*d^5 + 28*a^4*b^17*d^5 + 56
*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^
14*b^7*d^5 + a^16*b^5*d^5) - ((((e*cot(c + d*x))^(1/2)*(1800*a^23*b*d^2*e^1
9 - 1472*a*b^23*d^2*e^19 - 1024*a^3*b^21*d^2*e^19 + 8448*a^5*b^19*d^2*e^19
+ 46088*a^7*b^17*d^2*e^19 + 177344*a^9*b^15*d^2*e^19 + 402912*a^11*b^13*d^2
*e^19 + 541632*a^13*b^11*d^2*e^19 + 455472*a^15*b^9*d^2*e^19 + 248064*a^17*
b^7*d^2*e^19 + 87008*a^19*b^5*d^2*e^19 + 18240*a^21*b^3*d^2*e^19))/(b^21*d^
4 + 8*a^2*b^19*d^4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 +
56*a^10*b^11*d^4 + 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4) - (((12
8*a*b^26*d^4*e^15 + 3648*a^3*b^24*d^4*e^15 + 25536*a^5*b^22*d^4*e^15 + 8832
0*a^7*b^20*d^4*e^15 + 182784*a^9*b^18*d^4*e^15 + 244608*a^11*b^16*d^4*e^15
+ 217728*a^13*b^14*d^4*e^15 + 128256*a^15*b^12*d^4*e^15 + 48000*a^17*b^10*d
^4*e^15 + 10304*a^19*b^8*d^4*e^15 + 960*a^21*b^6*d^4*e^15)/(b^21*d^5 + 8*a^
2*b^19*d^5 + 28*a^4*b^17*d^5 + 56*a^6*b^15*d^5 + 70*a^8*b^13*d^5 + 56*a^10*
b^11*d^5 + 28*a^12*b^9*d^5 + 8*a^14*b^7*d^5 + a^16*b^5*d^5) + ((e*cot(c + d
*x))^(1/2)*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2)*(512*b^30*d^
4*e^10 + 4608*a^2*b^28*d^4*e^10 + 17920*a^4*b^26*d^4*e^10 + 38400*a^6*b^24*
d^4*e^10 + 46080*a^8*b^22*d^4*e^10 + 21504*a^10*b^20*d^4*e^10 - 21504*a^12*
b^18*d^4*e^10 - 46080*a^14*b^16*d^4*e^10 - 38400*a^16*b^14*d^4*e^10 - 17920
*a^18*b^12*d^4*e^10 - 4608*a^20*b^10*d^4*e^10 - 512*a^22*b^8*d^4*e^10))/(8*
(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)*(b^21*d^4 + 8*a^2*b^19*d^
4 + 28*a^4*b^17*d^4 + 56*a^6*b^15*d^4 + 70*a^8*b^13*d^4 + 56*a^10*b^11*d^4
+ 28*a^12*b^9*d^4 + 8*a^14*b^7*d^4 + a^16*b^5*d^4)))*(15*a^4 + 63*b^4 + 46*
a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^
6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d
+ 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d)))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*
(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d))
)*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^7*e^9)^(1/2))/(8*(b^13*d + 3*a^2*b
^11*d + 3*a^4*b^9*d + a^6*b^7*d))))*(15*a^4 + 63*b^4 + 46*a^2*b^2)*(-a^5*b^
7*e^9)^(1/2)*1i)/(4*(b^13*d + 3*a^2*b^11*d + 3*a^4*b^9*d + a^6*b^7*d))
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(9/2)/(a+b*cot(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.82 $\int \frac{(e\cot(c+dx))^{7/2}}{(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=476

$$\frac{e^{7/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}\,d\left(a^2+b^2\right)^3}-\frac{e^{7/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\right.}{2\sqrt{2}\,d}$$

```
[Out] -1/4*a^(3/2)*(3*a^4+6*a^2*b^2+35*b^4)*e^(7/2)*arctan(b^(1/2)*(e*cot(d*x+c))
^(1/2)/a^(1/2)/e^(1/2))/b^(5/2)/(a^2+b^2)^3/d+1/2*a^2*e^2*(e*cot(d*x+c))^(3
/2)/b/(a^2+b^2)/d/(a+b*cot(d*x+c))^2+1/2*(a+b)*(a^2-4*a*b+b^2)*e^(7/2)*arct
an(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1/2*(a+b)*
(a^2-4*a*b+b^2)*e^(7/2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2
+b^2)^3/d*2^(1/2)+1/4*(a-b)*(a^2+4*a*b+b^2)*e^(7/2)*ln(e^(1/2)+cot(d*x+c)*e
^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1/4*(a-b)*(a^2+4
*a*b+b^2)*e^(7/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2
))/(a^2+b^2)^3/d*2^(1/2)+1/4*a^2*(3*a^2+11*b^2)*e^3*(e*cot(d*x+c))^(1/2)/b^
2/(a^2+b^2)^2/d/(a+b*cot(d*x+c))
```

Rubi [A] time = 1.23, antiderivative size = 476, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.520$, Rules used = {3565, 3645, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{a^2e^3\left(3a^2+11b^2\right)\sqrt{e\cot(c+dx)}}{4b^2d\left(a^2+b^2\right)^2(a+b\cot(c+dx))}+\frac{a^2e^2(e\cot(c+dx))^{3/2}}{2bd\left(a^2+b^2\right)(a+b\cot(c+dx))^2}+\frac{e^{7/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c\right.}{2\sqrt{2}\,d\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(7/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(a^(3/2)*(3*a^4 + 6*a^2*b^2 + 35*b^4)*e^(7/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c
 + d*x]])/(Sqrt[a]*Sqrt[e])])/(4*b^(5/2)*(a^2 + b^2)^3*d) + ((a + b)*(a^2 -
 4*a*b + b^2)*e^(7/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(
Sqrt[2]*(a^2 + b^2)^3*d) - ((a + b)*(a^2 - 4*a*b + b^2)*e^(7/2)*ArcTan[1 +
(Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d) + (a^2*e
^2*(e*Cot[c + d*x])^(3/2))/(2*b*(a^2 + b^2)*d*(a + b*Cot[c + d*x])^2) + (a^
2*(3*a^2 + 11*b^2)*e^3*Sqrt[e*Cot[c + d*x]])/(4*b^2*(a^2 + b^2)^2*d*(a + b*
Cot[c + d*x])) + ((a - b)*(a^2 + 4*a*b + b^2)*e^(7/2)*Log[Sqrt[e] + Sqrt[e]
*Cot[c + d*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d)
- ((a - b)*(a^2 + 4*a*b + b^2)*e^(7/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] +
 Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3645

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*d^2 + c*(c*C - B*d))*(a + b*Tan[e
+ f*x])^m*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dis
t[1/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 1)*(c + d*Tan[e
+ f*x])^(n + 1)*Simp[A*d*(b*d*m - a*c*(n + 1)) + (c*C - B*d)*(b*c*m + a*d*(
```

```
n + 1)) - d*(n + 1)*((A - C)*(b*c - a*d) + B*(a*c + b*d))*Tan[e + f*x] - b*
(d*(B*c - A*d)*(m + n + 1) - C*(c^2*m - d^2*(n + 1)))*Tan[e + f*x]^2, x], x
], x] /; FreeQ[{a, b, c, d, e, f, A, B, C}, x] && NeQ[b*c - a*d, 0] && NeQ[
a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 0] && LtQ[n, -1]
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{7/2}}{(a+b\cot(c+dx))^3}\,dx = \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\int \frac{\sqrt{e\cot(c+dx)}\left(-\frac{3}{2}a^2e^3+2abe^3\cot(c+dx)-\frac{1}{2}\left(3a^2+4b^2\right)e^3\cot\cdots\right.}{(a+b\cot(c+dx))^2}}{2b\left(a^2+b^2\right)}$$

$$= \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2\left(3a^2+11b^2\right)e^3\sqrt{e\cot(c+dx)}}{4b^2\left(a^2+b^2\right)^2d(a+b\cot(c+dx))} + \frac{\int \frac{\frac{1}{4}a^2\left(3a^2\cdots\right.}{\cdots}}{\cdots}$$

$$= \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2\left(3a^2+11b^2\right)e^3\sqrt{e\cot(c+dx)}}{4b^2\left(a^2+b^2\right)^2d(a+b\cot(c+dx))} + \frac{\int \frac{2ab^2\left(a^2\cdots\right.}{\cdots}}{\cdots}$$

$$= \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2\left(3a^2+11b^2\right)e^3\sqrt{e\cot(c+dx)}}{4b^2\left(a^2+b^2\right)^2d(a+b\cot(c+dx))} + \frac{\text{Subst}\left(\int \cdots\right.}{\cdots}$$

$$= \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{a^2\left(3a^2+11b^2\right)e^3\sqrt{e\cot(c+dx)}}{4b^2\left(a^2+b^2\right)^2d(a+b\cot(c+dx))} - \frac{\left(a^2\left(3a^4\cdots\right.\right.}{\cdots}$$

$$= -\frac{a^{3/2}\left(3a^4+6a^2b^2+35b^4\right)e^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{5/2}\left(a^2+b^2\right)^3d} + \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+\cdots}$$

$$= -\frac{a^{3/2}\left(3a^4+6a^2b^2+35b^4\right)e^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{5/2}\left(a^2+b^2\right)^3d} + \frac{a^2e^2(e\cot(c+dx))^{3/2}}{2b\left(a^2+b^2\right)d(a+b\cot(c+\cdots}$$

$$= -\frac{a^{3/2}\left(3a^4+6a^2b^2+35b^4\right)e^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{5/2}\left(a^2+b^2\right)^3d} + \frac{(a+b)\left(a^2-4ab+b^2\right)e^{7/2}\cdots}{\sqrt{2}\left(a^2\cdots\right.}$$

Mathematica [C] time = 6.19, size = 525, normalized size = 1.10

$$-\frac{(e\cot(c+dx))^{7/2}\left(\frac{4b^2\cot^{\frac{9}{2}}(c+dx)\,{}_2F_1\left(2,\frac{9}{2};\frac{11}{2};-\frac{b\cot(c+dx)}{a}\right)}{9a\left(a^2+b^2\right)^2}+\frac{2b\left(3a^2-b^2\right)\left(-7\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)-3\cot^{\frac{7}{2}}(c+dx)+7\cot^{\frac{3}{2}}(c+dx)\cdots\right.}{21\left(a^2+b^2\right)^3}\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(7/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(((e*Cot[c + d*x])^(7/2)*((2*b*(3*a^2 - b^2)*Cot[c + d*x]^(7/2))/(7*(a^2 +
 b^2)^3) - (2*a*(3*a^2 - b^2)*(3*Cot[c + d*x]^(5/2) - 5*a*((-3*a*(-((Sqrt[a
]*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]])/b^(3/2)) + Sqrt[Cot[c + d*x
]]/b))/b + Cot[c + d*x]^(3/2)/b)))/(15*(a^2 + b^2)^3) + (2*b*(3*a^2 - b^2)*
(7*Cot[c + d*x]^(3/2) - 3*Cot[c + d*x]^(7/2) - 7*Cot[c + d*x]^(3/2)*Hyperge
ometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2]))/(21*(a^2 + b^2)^3) + (4*b^2*Cot[
c + d*x]^(9/2)*Hypergeometric2F1[2, 9/2, 11/2, -((b*Cot[c + d*x])/a)])/(9*a
*(a^2 + b^2)^2) + (2*b^2*Cot[c + d*x]^(9/2)*Hypergeometric2F1[3, 9/2, 11/2,
 -((b*Cot[c + d*x])/a)])/(9*a^3*(a^2 + b^2)) - (a*(a^2 - 3*b^2)*(40*Sqrt[Co
t[c + d*x]] - 8*Cot[c + d*x]^(5/2) + (5*(4*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt
[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]) + 2*Sqrt[
2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - 2*Sqrt[2]*Log[1 + S
qrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/2))/(20*(a^2 + b^2)^3)))/(d*Cot
[c + d*x]^(7/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{7}{2}}}{(b\cot(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(7/2)/(b*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.88, size = 1232, normalized size = 2.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] 5/4/d*e^4*a^6/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2/b*(e*cot(d*x+c))^(3/2)+9/2
/d*e^4*a^4/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*b*(e*cot(d*x+c))^(3/2)+13/4/d
*e^4*a^2/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*b^3*(e*cot(d*x+c))^(3/2)+3/4/d*
e^5*a^7/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2/b^2*(e*cot(d*x+c))^(1/2)+7/2/d*e
^5*a^5/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)+11/4/d*e^5*a
^3/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*b^2*(e*cot(d*x+c))^(1/2)-3/4/d*e^4*a^
6/(a^2+b^2)^3/b^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2)
)-3/2/d*e^4*a^4/(a^2+b^2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*
e*b)^(1/2))-35/4/d*e^4*a^2/(a^2+b^2)^3*b^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+
c))^(1/2)*b/(a*e*b)^(1/2))-1/4/d*e^3/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*
cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x
+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^3+3/4/d*e^3/(a
^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(
1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^
(1/2)+(e^2)^(1/2)))*a*b^2-1/2/d*e^3/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(
2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e^3/(a^2+b^2)^3*(e^2)
^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+1/2
/d*e^3/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)+1)*a^3-3/2/d*e^3/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+3/4/d*e^4/(a^2+b^2)^3*2^(1/2)/
(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)
^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
)*a^2*b-1/4/d*e^4/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1
/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3+3/2/d*e^4/(a^2+b^2)^3*2^(1/2)/(
e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d*e
```

```
^4/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c)
)^(1/2)+1)*b^3-3/2/d*e^4/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e
^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d*e^4/(a^2+b^2)^3*2^(1/2)/(e^2)
^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3
```

maxima [A] time = 0.75, size = 516, normalized size = 1.08

$$-\frac{\left(\frac{\left(3a^6+6a^4b^2+35a^2b^4\right)e^3\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^6b^2+3a^4b^4+3a^2b^6+b^8\right)\sqrt{abe}}+\frac{\left(\frac{2\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\sqrt{e}+2\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\sqrt{2}\left(a^3-3a^2b-3ab^2+b^3\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{\cdots}\right.}{\cdots}\right)}{\sqrt{e}}\cdots\right.}{\cdots}\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(7/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/4*((3*a^6 + 6*a^4*b^2 + 35*a^2*b^4)*e^3*arctan(b*sqrt(e/tan(d*x + c))/sq
rt(a*b*e))/((a^6*b^2 + 3*a^4*b^4 + 3*a^2*b^6 + b^8)*sqrt(a*b*e)) + (2*sqrt(
2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*
sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2
 + b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt
(e))/sqrt(e) + sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*log(sqrt(2)*sqrt(e)*
sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(a^3 + 3*a^2*b
 - 3*a*b^2 - b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x
 + c))/sqrt(e))*e^3/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) - ((3*a^5 + 11*a^3*
b^2)*e^4*sqrt(e/tan(d*x + c)) + (5*a^4*b + 13*a^2*b^3)*e^3*(e/tan(d*x + c))
^(3/2))/((a^6*b^2 + 2*a^4*b^4 + a^2*b^6)*e^2 + 2*(a^5*b^3 + 2*a^3*b^5 + a*b
^7)*e^2/tan(d*x + c) + (a^4*b^4 + 2*a^2*b^6 + b^8)*e^2/tan(d*x + c)^2))*e/d
```

mupad [B] time = 7.26, size = 20089, normalized size = 42.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(7/2)/(a + b*cot(c + d*x))^3,x)
```

```
[Out] (((e*cot(c + d*x))^(1/2)*(3*a^5*e^5 + 11*a^3*b^2*e^5))/(4*b^2*(a^4 + b^4 +
2*a^2*b^2)) + (e^4*(e*cot(c + d*x))^(3/2)*(5*a^4 + 13*a^2*b^2))/(4*b*(a^4 +
```

b^4 + 2*a^2*b^2)))/(a^2*d*e^2 + b^2*d*e^2*cot(c + d*x)^2 + 2*a*b*d*e^2*cot (c + d*x)) - atan(((((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16 *d^2*e^21 + 2758*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^ 10*d^2*e^21 + 7594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^ 4*d^2*e^21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15 *d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^ 5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4* b^21*d^4*e^14 + 45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584* a^10*b^15*d^4*e^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b ^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11* d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^ 5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(51 2*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400* a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21 504*a^12*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^1 0 - 17920*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^ 10))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^ 8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3* d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^ 2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e ^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^ 17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9* d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d ^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*2 0i + 15*a^4*b^2*d^2)))^(1/2))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6 i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/ 2) + ((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^2 4 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10 *b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^ 4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*1i - (((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 652 8*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21 582*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 2 46*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 2 8*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a ^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d

^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^
4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70
*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b
^3*d^5) - ((e*cot(c + d*x))^(1/2)*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d
^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))
^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^1
0 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4
*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^
12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*
b^6*d^4*e^10))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d
^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 +
a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*
6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c
+ d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d
^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13
*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15
*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4
+ 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56
*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)
/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3
*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a
*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*
d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^
2*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 -
1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a
^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10
*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(
b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*
d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*1i)/((9*a^12*b*e^28 + 280*a^2*b^11*e^28 +
1553*a^4*b^9*e^28 + 492*a^6*b^7*e^28 + 270*a^8*b^5*e^28 + 36*a^10*b^3*e^28
)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b
^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5
) + (((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 275
8*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7
594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90
*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b
^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*
d^5 + a^16*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 +
45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e
^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*
d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2
*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b
^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + ((e*cot(c + d*x
))^(1/2)*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15
*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^28*d^4*e^10

+ 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^
10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d
^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*
b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(b^19*d^4
+ 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56
*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)
/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3
*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(1472*a*b^
21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d
^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^
11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17
*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4
*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b
^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 +
a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2
d^2)))^(1/2))((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6
i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c
+ d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^
12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*
a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15
*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^
4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5
*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)
))^(1/2) + (((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^2
1 + 2758*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e
^21 + 7594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^
21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 5
6*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^
14*b^5*d^5 + a^16*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4
*e^14 + 45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^1
5*d^4*e^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^
16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5
+ 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56
*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) - ((e*cot(
c + d*x))^(1/2)*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*
6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^28*d
^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22
*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12
*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 1792
0*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(b^
19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d
^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((
e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^
2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(14
72*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5

*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*
a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 34
88*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 +
28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28
*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6
*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*
a^4*b^2*d^2)))^(1/2))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*
b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e
*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417
*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^2
4 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a
^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12
*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2
+ a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b
^2*d^2)))^(1/2)))*((e^7*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^
2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*2i - atan
(((((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*
a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 759
4*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a
^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^1
3*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^
5 + a^16*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 4
5312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^1
4 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^
4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b
^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9
*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + ((e*cot(c + d*x))
^(1/2)*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b
^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^28*d^4*e^10 +
4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10
+ 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4
*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*b^
10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(b^19*d^4 +
8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a
^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^
6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^
3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(1472*a*b^21
*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2
*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11
*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17*b
^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b
^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7
*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6
*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*1
5i)))^(1/2))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 -

a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i - (((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i)/((9*a^12*b*e^28 + 280*a^2*b^11*e^28 + 1553*a^4*b^9*e^28 + 492*a^6*b^7*e^28 + 270*a^8*b^5*e^28 + 36*a^10*b^3*e^28)/(b^19*d^5 + 8*a

^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10
*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + (((32*a*b^18*
d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^
21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*
e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^2
1)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*
b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^
5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19*d
^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^12*
b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a
^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^
4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*
b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(e^7/(4*
(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20
*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*
d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^
20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a
^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4
608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(b^19*d^4 + 8*a^2*b^17*d^4
+ 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 2
8*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*
d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4
*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*
a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a
^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 390
88*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 5
76*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^
6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b
^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*
a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e
^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15
i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(9*
a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^
6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 1
8*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^1
3*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^
4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b
*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (((32*
a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*a^5*b^14
*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7594*a^11*b
^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a^17*b^2*
d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 +
70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16
*b^3*d^5) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6
*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 9408

0*a^12*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)))*(e^7/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*2i - (atan((((((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4) - (((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) + ((((e*cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^1

7*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d
^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4) + (((1600*a^2*b^23*d^
4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17
*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^
14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^
20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13
*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5
 + a^16*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a
^3*b^5*e^7)^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b
^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^
10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38
400*a^16*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10
 - 512*a^22*b^6*d^4*e^10))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*
d)*(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*
b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^
4)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*
b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e
^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 3
5*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b
^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2)*1i)/(
8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)) + ((((e*cot(c + d*x))^(
1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24 + 1417*a^4*b^12*e^24 -
 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*b^6*e^24 + 39*a^12*b^4*
e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56
*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^1
4*b^5*d^4 + a^16*b^3*d^4) + (((32*a*b^18*d^2*e^21 - 18*a^19*d^2*e^21 - 6528
*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^21 + 26482*a^7*b^12*d^2*e^21 + 215
82*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*e^21 + 3314*a^13*b^6*d^2*e^21 + 24
6*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28
*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^
12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) - ((((e*cot(c + d*x))^(1/2)*(14
72*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b^19*d^2*e^17 + 1352*a^5
*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9*b^13*d^2*e^17 + 72640*
a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248*a^15*b^7*d^2*e^17 + 34
88*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19*d^4 + 8*a^2*b^17*d^4 +
 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28
*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4) - (((1600*a^2*b^23*d^4*e^14
+ 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19*d^4*e^14 + 91392*a^8*b^17*d^4*e^
14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^12*b^13*d^4*e^14 + 48384*a^14*b^11
*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*d^4*e^14 + 64*a^20*b^5*
d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 +
70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16
*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*
e^7)^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^10 + 17920*a^4*b^24*d^4
*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4*e^10 + 21504*a^10*b^18

*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a^14*b^14*d^4*e^10 - 38400*a^1
6*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4608*a^20*b^8*d^4*e^10 - 512*a
^22*b^6*d^4*e^10))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)*(b^1
9*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^
4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4)))*(3
*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d +
 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/
2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 +
 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d +
a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2)*1i)/(8*(b^11
*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))/((9*a^12*b*e^28 + 280*a^2*b^1
1*e^28 + 1553*a^4*b^9*e^28 + 492*a^6*b^7*e^28 + 270*a^8*b^5*e^28 + 36*a^10*
b^3*e^28)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 +
70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16
*b^3*d^5) - ((((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2
*b^14*e^24 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 -
1020*a^10*b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^
2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*
b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4) - (((32*a*b^18*d
^2*e^21 - 18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^2
1 + 26482*a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*e
^21 + 3314*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^21
)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b
^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5
) + ((((e*cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 +
1024*a^3*b^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 +
 70240*a^9*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^
17 + 13248*a^15*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^
17))/(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^
8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*
d^4) + (((1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19
*d^4*e^14 + 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^1
2*b^13*d^4*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112
*a^18*b^7*d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*
a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^1
2*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(3*a^4
 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b
^26*d^4*e^10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^
8*b^20*d^4*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 460
80*a^14*b^14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10
 - 4608*a^20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(8*(b^11*d + 3*a^2*b^9*
d + 3*a^4*b^7*d + a^6*b^5*d)*(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 +
 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*
a^14*b^5*d^4 + a^16*b^3*d^4)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^
(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^

```
4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d
 + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11
*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*
(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d))
+ ((((e*cot(c + d*x))^(1/2)*(9*a^16*e^24 + 32*b^16*e^24 + 128*a^2*b^14*e^24
 + 1417*a^4*b^12*e^24 - 6802*a^6*b^10*e^24 - 1017*a^8*b^8*e^24 - 1020*a^10*
b^6*e^24 + 39*a^12*b^4*e^24 - 18*a^14*b^2*e^24))/(b^19*d^4 + 8*a^2*b^17*d^4
 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 +
28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4) + (((32*a*b^18*d^2*e^21 -
18*a^19*d^2*e^21 - 6528*a^3*b^16*d^2*e^21 + 2758*a^5*b^14*d^2*e^21 + 26482*
a^7*b^12*d^2*e^21 + 21582*a^9*b^10*d^2*e^21 + 7594*a^11*b^8*d^2*e^21 + 3314
*a^13*b^6*d^2*e^21 + 246*a^15*b^4*d^2*e^21 + 90*a^17*b^2*d^2*e^21)/(b^19*d^
5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 +
56*a^10*b^9*d^5 + 28*a^12*b^7*d^5 + 8*a^14*b^5*d^5 + a^16*b^3*d^5) - ((((e*
cot(c + d*x))^(1/2)*(1472*a*b^21*d^2*e^17 + 72*a^21*b*d^2*e^17 + 1024*a^3*b
^19*d^2*e^17 + 1352*a^5*b^17*d^2*e^17 + 28224*a^7*b^15*d^2*e^17 + 70240*a^9
*b^13*d^2*e^17 + 72640*a^11*b^11*d^2*e^17 + 39088*a^13*b^9*d^2*e^17 + 13248
*a^15*b^7*d^2*e^17 + 3488*a^17*b^5*d^2*e^17 + 576*a^19*b^3*d^2*e^17))/(b^19
*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^13*d^4 + 70*a^8*b^11*d^4
 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d^4 + a^16*b^3*d^4) - (((
1600*a^2*b^23*d^4*e^14 + 12864*a^4*b^21*d^4*e^14 + 45312*a^6*b^19*d^4*e^14
+ 91392*a^8*b^17*d^4*e^14 + 115584*a^10*b^15*d^4*e^14 + 94080*a^12*b^13*d^4
*e^14 + 48384*a^14*b^11*d^4*e^14 + 14592*a^16*b^9*d^4*e^14 + 2112*a^18*b^7*
d^4*e^14 + 64*a^20*b^5*d^4*e^14)/(b^19*d^5 + 8*a^2*b^17*d^5 + 28*a^4*b^15*d
^5 + 56*a^6*b^13*d^5 + 70*a^8*b^11*d^5 + 56*a^10*b^9*d^5 + 28*a^12*b^7*d^5
+ 8*a^14*b^5*d^5 + a^16*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(3*a^4 + 35*b^4
+ 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2)*(512*b^28*d^4*e^10 + 4608*a^2*b^26*d^4*e^
10 + 17920*a^4*b^24*d^4*e^10 + 38400*a^6*b^22*d^4*e^10 + 46080*a^8*b^20*d^4
*e^10 + 21504*a^10*b^18*d^4*e^10 - 21504*a^12*b^16*d^4*e^10 - 46080*a^14*b^
14*d^4*e^10 - 38400*a^16*b^12*d^4*e^10 - 17920*a^18*b^10*d^4*e^10 - 4608*a^
20*b^8*d^4*e^10 - 512*a^22*b^6*d^4*e^10))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*
b^7*d + a^6*b^5*d)*(b^19*d^4 + 8*a^2*b^17*d^4 + 28*a^4*b^15*d^4 + 56*a^6*b^
13*d^4 + 70*a^8*b^11*d^4 + 56*a^10*b^9*d^4 + 28*a^12*b^7*d^4 + 8*a^14*b^5*d
^4 + a^16*b^3*d^4)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*
(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*
b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5
*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2))/(8*(b^11*d + 3*a^2
*b^9*d + 3*a^4*b^7*d + a^6*b^5*d)))*(3*a^4 + 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*
e^7)^(1/2))/(8*(b^11*d + 3*a^2*b^9*d + 3*a^4*b^7*d + a^6*b^5*d))))*(3*a^4 +
 35*b^4 + 6*a^2*b^2)*(-a^3*b^5*e^7)^(1/2)*1i)/(4*(b^11*d + 3*a^2*b^9*d + 3*
a^4*b^7*d + a^6*b^5*d))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(7/2)/(a+b*cot(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.83 $\int \frac{(e\cot(c+dx))^{5/2}}{(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=470

$$\frac{e^{5/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)^3}-\frac{e^{5/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\,\mathrm{c}\right.}{2\sqrt{2}d\,(}$$

```
[Out] -1/2*(a-b)*(a^2+4*a*b+b^2)*e^(5/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^
(1/2))/(a^2+b^2)^3/d*2^(1/2)+1/2*(a-b)*(a^2+4*a*b+b^2)*e^(5/2)*arctan(1+2^(
1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^3/d*2^(1/2)+1/4*(a+b)*(a^2-4*a
*b+b^2)*e^(5/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))
/(a^2+b^2)^3/d*2^(1/2)-1/4*(a+b)*(a^2-4*a*b+b^2)*e^(5/2)*ln(e^(1/2)+cot(d*x
+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1/4*(a^4+18
*a^2*b^2-15*b^4)*e^(5/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2
))*a^(1/2)/b^(3/2)/(a^2+b^2)^3/d+1/2*a^2*e^2*(e*cot(d*x+c))^(1/2)/b/(a^2+b^
2)/d/(a+b*cot(d*x+c))^2-1/4*a*(a^2+9*b^2)*e^2*(e*cot(d*x+c))^(1/2)/b/(a^2+b
^2)^2/d/(a+b*cot(d*x+c))
```

Rubi [A] time = 1.29, antiderivative size = 470, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3565, 3649, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{ae^2\left(a^2+9b^2\right)\sqrt{e\cot(c+dx)}}{4bd\left(a^2+b^2\right)^2(a+b\cot(c+dx))}+\frac{a^2e^2\sqrt{e\cot(c+dx)}}{2bd\left(a^2+b^2\right)(a+b\cot(c+dx))^2}+\frac{e^{5/2}(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c\right.}{2\sqrt{2}d\left(a^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(5/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(Sqrt[a]*(a^4 + 18*a^2*b^2 - 15*b^4)*e^(5/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c
+ d*x]])/(Sqrt[a]*Sqrt[e])])/(4*b^(3/2)*(a^2 + b^2)^3*d) - ((a - b)*(a^2 +
4*a*b + b^2)*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(S
qrt[2]*(a^2 + b^2)^3*d) + ((a - b)*(a^2 + 4*a*b + b^2)*e^(5/2)*ArcTan[1 + (
Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d) + (a^2*e^
2*Sqrt[e*Cot[c + d*x]])/(2*b*(a^2 + b^2)*d*(a + b*Cot[c + d*x])^2) - (a*(a^
2 + 9*b^2)*e^2*Sqrt[e*Cot[c + d*x]])/(4*b*(a^2 + b^2)^2*d*(a + b*Cot[c + d*
x])) + ((a + b)*(a^2 - 4*a*b + b^2)*e^(5/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d
*x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d) - ((a + b)
*(a^2 - 4*a*b + b^2)*e^(5/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*S
qrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3565

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)^2*(a + b*Tan[e + f*x])^(
m - 2)*(c + d*Tan[e + f*x])^(n + 1))/(d*f*(n + 1)*(c^2 + d^2)), x] - Dist[1
/(d*(n + 1)*(c^2 + d^2)), Int[(a + b*Tan[e + f*x])^(m - 3)*(c + d*Tan[e + f
*x])^(n + 1)*Simp[a^2*d*(b*d*(m - 2) - a*c*(n + 1)) + b*(b*c - 2*a*d)*(b*c*
(m - 2) + a*d*(n + 1)) - d*(n + 1)*(3*a^2*b*c - b^3*c - a^3*d + 3*a*b^2*d)*
Tan[e + f*x] - b*(a*d*(2*b*c - a*d)*(m + n - 1) - b^2*(c^2*(m - 2) - d^2*(n
 + 1)))*Tan[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && GtQ[m, 2] && LtQ[
n, -1] && IntegerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
```

```
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{5/2}}{(a+b\cot(c+dx))^3}\,dx = \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\int \frac{-\frac{1}{2}a^2e^3+2abe^3\cot(c+dx)-\frac{1}{2}\left(a^2+4b^2\right)e^3\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2}\,dx}{2b\left(a^2+b^2\right)}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{a\left(a^2+9b^2\right)e^2\sqrt{e\cot(c+dx)}}{4b\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\int \frac{1}{4}a^2\left(a^2-7b^2 \cdots\right.}{\cdots}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{a\left(a^2+9b^2\right)e^2\sqrt{e\cot(c+dx)}}{4b\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\int \frac{-2ab^2\left(3a^2- \cdots\right.}{\cdots}}{\cdots}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{a\left(a^2+9b^2\right)e^2\sqrt{e\cot(c+dx)}}{4b\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\text{Subst}\left(\int \frac{2a \cdots}{\cdots}\right.}{\cdots}$$

$$= \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{a\left(a^2+9b^2\right)e^2\sqrt{e\cot(c+dx)}}{4b\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} - \frac{\left(a\left(a^4+18a \cdots\right.\right.}{\cdots}$$

$$= -\frac{\sqrt{a}\left(a^4+18a^2b^2-15b^4\right)e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{3/2}\left(a^2+b^2\right)^3 d} + \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+ \cdots}$$

$$= -\frac{\sqrt{a}\left(a^4+18a^2b^2-15b^4\right)e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{3/2}\left(a^2+b^2\right)^3 d} + \frac{a^2e^2\sqrt{e\cot(c+dx)}}{2b\left(a^2+b^2\right)d(a+b\cot(c+ \cdots}$$

$$= -\frac{\sqrt{a}\left(a^4+18a^2b^2-15b^4\right)e^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4b^{3/2}\left(a^2+b^2\right)^3 d} - \frac{(a-b)\left(a^2+4ab+b^2\right)e^{5/2}\,\text{ta} \cdots}{\sqrt{2}\left(a^2+ \cdots\right.}$$

Mathematica [C] time = 6.20, size = 488, normalized size = 1.04

$$-\frac{(e\cot(c+dx))^{5/2}\left(\frac{4b^2\cot^{\frac{7}{2}}(c+dx)\,{}_2F_1\left(2,\frac{7}{2};\frac{9}{2};-\frac{b\cot(c+dx)}{a}\right)}{7a\left(a^2+b^2\right)^2} + \frac{2a\left(a^2-3b^2\right)\left(\cot^{\frac{3}{2}}(c+dx)-\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)\right)}{3\left(a^2+b^2\right)^3} + \frac{2b\left(3a^2-b^2\right) \cdots}{5\left(a^2+ \cdots\right.} \cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(5/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(((e*Cot[c + d*x])^(5/2)*((2*b*(3*a^2 - b^2)*Cot[c + d*x]^(5/2))/(5*(a^2 +
 b^2)^3) - (2*a*(3*a^2 - b^2)*(-3*a*(-((Sqrt[a]*ArcTan[(Sqrt[b]*Sqrt[Cot[c
+ d*x]])/Sqrt[a]])/b^(3/2)) + Sqrt[Cot[c + d*x]]/b) + Cot[c + d*x]^(3/2)))/
(3*(a^2 + b^2)^3) + (2*a*(a^2 - 3*b^2)*(Cot[c + d*x]^(3/2) - Cot[c + d*x]^(
3/2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c + d*x]^2]))/(3*(a^2 + b^2)^3) +
(4*b^2*Cot[c + d*x]^(7/2)*Hypergeometric2F1[2, 7/2, 9/2, -((b*Cot[c + d*x])
/a)])/(7*a*(a^2 + b^2)^2) + (2*b^2*Cot[c + d*x]^(7/2)*Hypergeometric2F1[3,
7/2, 9/2, -((b*Cot[c + d*x])/a)])/(7*a^3*(a^2 + b^2)) + (b*(3*a^2 - b^2)*(4
0*Sqrt[Cot[c + d*x]] - 8*Cot[c + d*x]^(5/2) + (5*(4*(Sqrt[2]*ArcTan[1 - Sqr
t[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]])
+ 2*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - 2*Sqrt[2]*
Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/2))/(20*(a^2 + b^2)^3)
))/(d*Cot[c + d*x]^(5/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{5}{2}}}{(b\cot(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(5/2)/(b*cot(d*x + c) + a)^3, x)
```

maple [B] time = 1.00, size = 1229, normalized size = 2.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] -1/4/d*e^3*a^5/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)-5/2/
d*e^3*a^3/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)*b^2-9/4/d
*e^3*a/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)*b^4+1/4/d*e^
4*a^6/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2/b*(e*cot(d*x+c))^(1/2)-3/2/d*e^4*a
^4/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*b*(e*cot(d*x+c))^(1/2)-7/4/d*e^4*a^2/
(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*b^3*(e*cot(d*x+c))^(1/2)-1/4/d*e^3*a^5/(
a^2+b^2)^3/b/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-9/2
/d*e^3*a^3/(a^2+b^2)^3*b/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b
)^(1/2))+15/4/d*e^3*a/(a^2+b^2)^3*b^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(
1/2)*b/(a*e*b)^(1/2))+3/2/d*e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1
/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d*e^2/(a^2+b^2)^3*(e^2)^(
1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3-3/2/d*e
^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c
))^(1/2)+1)*a^2*b+1/2/d*e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)
/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+3/4/d*e^2/(a^2+b^2)^3*(e^2)^(1/4)*
2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/
2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^
2*b-1/4/d*e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3+1/2/d*e^3/(a^2+b^2)^3*2^(1/2)/(e^2)
^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3-3/2/d*e^3/(a^
2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)+1)*a*b^2-1/2/d*e^3/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^
(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e^3/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)
*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+1/4/d*e^3/(a^2+b
^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)
*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2
)+(e^2)^(1/2)))*a^3-3/4/d*e^3/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x
+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^
2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2
```

maxima [A] time = 0.56, size = 505, normalized size = 1.07

$$-\frac{\left(\frac{\left(a^{5}+18\,a^{3}b^{2}-15\,ab^{4}\right)e^{2}\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{6}b+3\,a^{4}b^{3}+3\,a^{2}b^{5}+b^{7}\right)\sqrt{abe}}-\frac{\left(\frac{2\,\sqrt{2}\left(a^{3}+3\,a^{2}b-3\,ab^{2}-b^{3}\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^{3}+3\,a^{2}b-3\,ab^{2}-b^{3}\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\right.}{}\right.}{\sqrt{e}}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(5/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/4*((a^5 + 18*a^3*b^2 - 15*a*b^4)*e^2*arctan(b*sqrt(e/tan(d*x + c))/sqrt(
a*b*e))/((a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*sqrt(a*b*e)) - (2*sqrt(2)*(a
^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(
e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^
3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/
sqrt(e) - sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(sqrt(2)*sqrt(e)*sqrt(
e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*b - 3*
a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c)
)/sqrt(e))*e^2/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) - ((a^4 - 7*a^2*b^2)*e^3
*sqrt(e/tan(d*x + c)) - (a^3*b + 9*a*b^3)*e^2*(e/tan(d*x + c))^(3/2))/((a^6
*b + 2*a^4*b^3 + a^2*b^5)*e^2 + 2*(a^5*b^2 + 2*a^3*b^4 + a*b^6)*e^2/tan(d*x
 + c) + (a^4*b^3 + 2*a^2*b^5 + b^7)*e^2/tan(d*x + c)^2))*e/d
```

mupad [B] time = 6.51, size = 19256, normalized size = 40.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(5/2)/(a + b*cot(c + d*x))^3,x)
```

```
[Out] atan(((((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^
18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^1
8 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5
+ 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*
a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d^4*e^13 +
 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13
 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*
e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*
e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^
11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^
5) + ((e*cot(c + d*x))^(1/2)*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6
i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/
2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 +
38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^1
0 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d
^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d
^4*e^10))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^
6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^
3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15
*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x)
)^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 +
```

11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*1i - (((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d

```
^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 +
 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^
5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2
)))^(1/2)*1i)/((((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^
13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^
7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^
16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*
d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d
^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16
*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*
b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19
*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 +
56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^
14*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*
b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d
^2)))^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^
4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^1
6*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^
16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a
^22*b^4*d^4*e^10))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^
4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 +
8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^
2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot
(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d
^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11
*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5
*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4
 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 2
8*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*
d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2))
)^(1/2))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 1
5*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x
))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20
+ 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^
20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^1
1*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4
))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*
b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (((10*a^16*b*d^2*e^18
 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18
 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18
+ 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b
^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*
d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 1
7664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13
- 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e
```

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^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^
5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 5
6*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((e*cot(c + d*x))^(1/2
)*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b
^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^26*d^4*e^10 + 460
8*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 4
6080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^1
0 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^
4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(b^17*d^4 + a^16*
b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4
 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*
d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*
20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15
- 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 +
10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 +
 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/
(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4
 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-
(e^5*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d
^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*(-(e^5*1i)/(4*(b^6*d^2 - a^
6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15
*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 +
 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e
^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*
b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7
*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-(e^5*1i)/(4*(b^6*d^2 - a^6*d^2
+ a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b
^2*d^2)))^(1/2) + (a^11*e^23 - 120*a*b^10*e^23 + 249*a^3*b^8*e^23 - 388*a^5
*b^6*e^23 + 302*a^7*b^4*e^23 + 36*a^9*b^2*e^23)/(b^17*d^5 + a^16*b*d^5 + 8*
a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10
*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5)))*(-(e^5*1i)/(4*(b^6*d^2 - a^6
*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*
a^4*b^2*d^2)))^(1/2)*2i - ((e^3*(e*cot(c + d*x))^(3/2)*(9*a*b^2 + a^3))/(4*
(a^4 + b^4 + 2*a^2*b^2)) - ((e*cot(c + d*x))^(1/2)*(a^4*e^4 - 7*a^2*b^2*e^4
))/(4*b*(a^4 + b^4 + 2*a^2*b^2)))/(a^2*d*e^2 + b^2*d*e^2*cot(c + d*x)^2 + 2
*a*b*d*e^2*cot(c + d*x)) + atan(((((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*
e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e
^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^
18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11
*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5)
 - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^1
3 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*
e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d
^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 +
28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a
```

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^12*b^5*d^5 + 8*a^14*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^6*d^2*1
i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d
^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 +
 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^1
0 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d
^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^
6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^
4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 +
28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*
b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)
))^(1/2) - ((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^1
5 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^
15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^
15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^
4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 5
6*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i -
a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 +
 a^4*b^2*d^2*15i)))^(1/2))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2
+ 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)
 + ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2
082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^2
0 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^1
3*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^
4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^
5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i -
(((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7
386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 29
46*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^
2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b
^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d^4*e^13 + 5952*
a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 188
16*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 -
 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/
(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5
 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (
(e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*
a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(51
2*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*
a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21
504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^1
0 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^1
0))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11
*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4)
)*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d
^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2
```

)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i)/((((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^1

0*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (a^11*e^23 - 120*a*b^10*e^23 + 249*a^3*b^8*e^23 - 388*a^5*b^6*e^23 + 302*a^7*b^4*e^23 + 36*a^9*b^2*e^23)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5)))*(-e^5/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*2i + (atan((((((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^2

0 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*
e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b
^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d
^4) - (((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^
18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^1
8 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5
+ 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*
a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((((e*cot(c + d*x))^(1/2
)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328
*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 532
8*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384
*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*
d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4
+ 8*a^14*b^3*d^4) + (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664
*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 26
88*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13
- 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 +
8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^
10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(a
^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*
b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a
^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46
080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10
- 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(8*(b^9*d + 3*a^2*b^7*d
+ 3*a^4*b^5*d + a^6*b^3*d)*(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^
4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b
^5*d^4 + 8*a^14*b^3*d^4)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/
(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2
b^2)(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d
)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d
+ 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2
)*1i)/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)) + ((((e*cot(c + d
x))^(1/2)(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^2
0 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*
e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b
^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d
^4) + (((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^
18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^1
8 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5
+ 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*
a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) + ((((e*cot(c + d*x))^(1/2
)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328
*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 532
8*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384
*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*

d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4) - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)*(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2)*1i)/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))/((a^11*e^23 - 120*a*b^10*e^23 + 249*a^3*b^8*e^23 - 388*a^5*b^6*e^23 + 302*a^7*b^4*e^23 + 36*a^9*b^2*e^23)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4) - (((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4) + (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) - ((e*cot(c + d*x))^(1/2)*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 3840

0*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)*(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)) + ((((e*cot(c + d*x))^(1/2)*(a^14*e^20 - 32*b^14*e^20 + 97*a^2*b^12*e^20 - 2082*a^4*b^10*e^20 + 3631*a^6*b^8*e^20 - 2300*a^8*b^6*e^20 + 79*a^10*b^4*e^20 + 30*a^12*b^2*e^20))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4) + (((10*a^16*b*d^2*e^18 - 2398*a^2*b^15*d^2*e^18 + 5238*a^4*b^13*d^2*e^18 + 7386*a^6*b^11*d^2*e^18 - 8322*a^8*b^9*d^2*e^18 - 5498*a^10*b^7*d^2*e^18 + 2946*a^12*b^5*d^2*e^18 + 382*a^14*b^3*d^2*e^18)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) + ((((e*cot(c + d*x))^(1/2)*(8*a^19*b*d^2*e^15 - 1472*a*b^19*d^2*e^15 + 776*a^3*b^17*d^2*e^15 + 11328*a^5*b^15*d^2*e^15 + 10208*a^7*b^13*d^2*e^15 - 5056*a^9*b^11*d^2*e^15 - 5328*a^11*b^9*d^2*e^15 + 4032*a^13*b^7*d^2*e^15 + 3552*a^15*b^5*d^2*e^15 + 384*a^17*b^3*d^2*e^15))/(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4) - (((832*a*b^22*d^4*e^13 + 5952*a^3*b^20*d^4*e^13 + 17664*a^5*b^18*d^4*e^13 + 26880*a^7*b^16*d^4*e^13 + 18816*a^9*b^14*d^4*e^13 - 2688*a^11*b^12*d^4*e^13 - 16128*a^13*b^10*d^4*e^13 - 13056*a^15*b^8*d^4*e^13 - 4800*a^17*b^6*d^4*e^13 - 704*a^19*b^4*d^4*e^13)/(b^17*d^5 + a^16*b*d^5 + 8*a^2*b^15*d^5 + 28*a^4*b^13*d^5 + 56*a^6*b^11*d^5 + 70*a^8*b^9*d^5 + 56*a^10*b^7*d^5 + 28*a^12*b^5*d^5 + 8*a^14*b^3*d^5) + ((e*cot(c + d*x))^(1/2)*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2)*(512*b^26*d^4*e^10 + 4608*a^2*b^24*d^4*e^10 + 17920*a^4*b^22*d^4*e^10 + 38400*a^6*b^20*d^4*e^10 + 46080*a^8*b^18*d^4*e^10 + 21504*a^10*b^16*d^4*e^10 - 21504*a^12*b^14*d^4*e^10 - 46080*a^14*b^12*d^4*e^10 - 38400*a^16*b^10*d^4*e^10 - 17920*a^18*b^8*d^4*e^10 - 4608*a^20*b^6*d^4*e^10 - 512*a^22*b^4*d^4*e^10))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)*(b^17*d^4 + a^16*b*d^4 + 8*a^2*b^15*d^4 + 28*a^4*b^13*d^4 + 56*a^6*b^11*d^4 + 70*a^8*b^9*d^4 + 56*a^10*b^7*d^4 + 28*a^12*b^5*d^4 + 8*a^14*b^3*d^4)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d)))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2))/(8*(b^9*d + 3*a^2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d))))*(a^4 - 15*b^4 + 18*a^2*b^2)*(-a*b^3*e^5)^(1/2)*1i)/(4*(b^9*d + 3*a^

```
2*b^7*d + 3*a^4*b^5*d + a^6*b^3*d))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(c+dx))^{\frac{5}{2}}}{(a+b\cot(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(5/2)/(a+b*cot(d*x+c))**3,x)
```

```
[Out] Integral((e*cot(c + d*x))**(5/2)/(a + b*cot(c + d*x))**3, x)
```

3.84 $\int \frac{(e\cot(c+dx))^{3/2}}{(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=461

$$-\frac{e^{3/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)^3}+\frac{e^{3/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\right.}{2\sqrt{2}d}$$

```
[Out] -1/2*(a+b)*(a^2-4*a*b+b^2)*e^(3/2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^
(1/2))/(a^2+b^2)^3/d*2^(1/2)+1/2*(a+b)*(a^2-4*a*b+b^2)*e^(3/2)*arctan(1+2^(
1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1/4*(a-b)*(a^2+4*a
*b+b^2)*e^(3/2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))
/(a^2+b^2)^3/d*2^(1/2)+1/4*(a-b)*(a^2+4*a*b+b^2)*e^(3/2)*ln(e^(1/2)+cot(d*x
+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^3/d*2^(1/2)-1/4*(3*a^4-
26*a^2*b^2+3*b^4)*e^(3/2)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/
2))/(a^2+b^2)^3/d/a^(1/2)/b^(1/2)-1/2*a*e*(e*cot(d*x+c))^(1/2)/(a^2+b^2)/d/
(a+b*cot(d*x+c))^2-1/4*(3*a^2-5*b^2)*e*(e*cot(d*x+c))^(1/2)/(a^2+b^2)^2/d/(
a+b*cot(d*x+c))
```

Rubi [A] time = 1.23, antiderivative size = 461, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3567, 3649, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{e^{3/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}d\left(a^2+b^2\right)^3}+\frac{e^{3/2}(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\right.}{2\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cot[c + d*x])^(3/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -((3*a^4 - 26*a^2*b^2 + 3*b^4)*e^(3/2)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]]
)/(Sqrt[a]*Sqrt[e])])/(4*Sqrt[a]*Sqrt[b]*(a^2 + b^2)^3*d) - ((a + b)*(a^2 -
 4*a*b + b^2)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(
Sqrt[2]*(a^2 + b^2)^3*d) + ((a + b)*(a^2 - 4*a*b + b^2)*e^(3/2)*ArcTan[1 +
(Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d) - (a*e*S
qrt[e*Cot[c + d*x]])/(2*(a^2 + b^2)*d*(a + b*Cot[c + d*x])^2) - ((3*a^2 - 5
*b^2)*e*Sqrt[e*Cot[c + d*x]])/(4*(a^2 + b^2)^2*d*(a + b*Cot[c + d*x])) - ((
a - b)*(a^2 + 4*a*b + b^2)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqr
t[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d) + ((a - b)*(a^2 + 4
*a*b + b^2)*e^(3/2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot
[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3567

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m
+ 1)*(c + d*Tan[e + f*x])^(n - 1))/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m
 + 1)*(a^2 + b^2)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(
n - 2)*Simp[a*c^2*(m + 1) + a*d^2*(n - 1) + b*c*d*(m - n + 2) - (b*c^2 - 2*
a*c*d - b*d^2)*(m + 1)*Tan[e + f*x] - d*(b*c - a*d)*(m + n)*Tan[e + f*x]^2,
 x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2
 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && LtQ[1, n, 2] && IntegerQ[2
*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
```

```
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{(e\cot(c+dx))^{3/2}}{(a+b\cot(c+dx))^3}\,dx = -\frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\int \frac{\frac{ae^2}{2}-2be^2\cot(c+dx)-\frac{3}{2}ae^2\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2}\,dx}{2\left(a^2+b^2\right)}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\left(3a^2-5b^2\right)e\sqrt{e\cot(c+dx)}}{4\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\int \frac{-\frac{1}{4}a\left(5a^2-3b^2\right.}{}}{}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\left(3a^2-5b^2\right)e\sqrt{e\cot(c+dx)}}{4\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\int \frac{-2a^2\left(a^2-3b^2\right.}{}}{2}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\left(3a^2-5b^2\right)e\sqrt{e\cot(c+dx)}}{4\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\text{Subst}\left(\int \frac{2a^2}{}\right.}{}$$

$$= -\frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\left(3a^2-5b^2\right)e\sqrt{e\cot(c+dx)}}{4\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} - \frac{\left(\left(3a^4-26a^2\right.\right.}{}$$

$$= -\frac{\left(3a^4-26a^2b^2+3b^4\right)e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{4\sqrt{a}\,\sqrt{b}\,\left(a^2+b^2\right)^3 d} - \frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2}$$

$$= -\frac{\left(3a^4-26a^2b^2+3b^4\right)e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{4\sqrt{a}\,\sqrt{b}\,\left(a^2+b^2\right)^3 d} - \frac{ae\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2}$$

$$= -\frac{\left(3a^4-26a^2b^2+3b^4\right)e^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{4\sqrt{a}\,\sqrt{b}\,\left(a^2+b^2\right)^3 d} - \frac{(a+b)\left(a^2-4ab+b^2\right)e^{3/2}\tan^{-1}}{\sqrt{2}\,\left(a^2+b^2\right)^3}$$

Mathematica [C] time = 6.16, size = 518, normalized size = 1.12

$$-\frac{(e\cot(c+dx))^{3/2}\left(\frac{4b^2\cot^{\frac{5}{2}}(c+dx)\,{}_2F_1\left(2,\frac{5}{2};\frac{7}{2};-\frac{b\cot(c+dx)}{a}\right)}{5a\left(a^2+b^2\right)^2} - \frac{2b\left(3a^2-b^2\right)\left(\cot^{\frac{3}{2}}(c+dx)-\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)\right)}{3\left(a^2+b^2\right)^3} + \frac{2b\left(3a^2-b^2\right)}{3\left(a^2+\right.}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cot[c + d*x])^(3/2)/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -(((e*Cot[c + d*x])^(3/2)*((-2*a*(3*a^2 - b^2)*(-((Sqrt[a]*ArcTan[(Sqrt[b]*
Sqrt[Cot[c + d*x]])/Sqrt[a]])/Sqrt[b]) + Sqrt[Cot[c + d*x]]))/(a^2 + b^2)^3
 + (2*b*(3*a^2 - b^2)*Cot[c + d*x]^(3/2))/(3*(a^2 + b^2)^3) - ((-3*Sqrt[b]*
ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]]*Sqrt[Cot[c + d*x]])/Sqrt[a] +
(2*b^2*Cot[c + d*x]^2)/(a + b*Cot[c + d*x])^2 + (3*b*Cot[c + d*x])/(a + b*C
ot[c + d*x]))/(4*b*(a^2 + b^2)*Sqrt[Cot[c + d*x]]) - (2*b*(3*a^2 - b^2)*(Co
t[c + d*x]^(3/2) - Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -Cot[c
 + d*x]^2]))/(3*(a^2 + b^2)^3) + (4*b^2*Cot[c + d*x]^(5/2)*Hypergeometric2F
1[2, 5/2, 7/2, -((b*Cot[c + d*x])/a)])/(5*a*(a^2 + b^2)^2) + (a*(a^2 - 3*b^
2)*(2*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 +
Sqrt[2]*Sqrt[Cot[c + d*x]]]) + 8*Sqrt[Cot[c + d*x]] + Sqrt[2]*Log[1 - Sqrt[
2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c
+ d*x]] + Cot[c + d*x]]))/(4*(a^2 + b^2)^3)))/(d*Cot[c + d*x]^(3/2)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(dx+c))^{\frac{3}{2}}}{(b\cot(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*cot(d*x + c))^(3/2)/(b*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.87, size = 1212, normalized size = 2.63

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] -3/4/d*e^2/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)*b*a^4+1/
2/d*e^2/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)*a^2*b^3+5/4
/d*e^2/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)*b^5-5/4/d*e^
3/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)*a^5-1/2/d*e^3/(a^
2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)*a^3*b^2+3/4/d*e^3/(a^2
+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)*a*b^4-3/4/d*e^2/(a^2+b^
2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))*a^4+13/2/d*
e^2/(a^2+b^2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))*
a^2*b^2-3/4/d*e^2/(a^2+b^2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(
a*e*b)^(1/2))*b^4-1/2/d*e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(
e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1
/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+1/4/d*e/(a^2+
b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/
2)+(e^2)^(1/2)))*a^3-3/4/d*e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+
c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2
)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2+1/2/d*e/(a^2+b^2)^
3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^
3-3/2/d*e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot
(d*x+c))^(1/2)+1)*a*b^2+3/2/d*e^2/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2
^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d*e^2/(a^2+b^2)^3*2^(1
/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3-3/2
/d*e^2/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)*a^2*b+1/2/d*e^2/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/
2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3-3/4/d*e^2/(a^2+b^2)^3*2^(1/2)/(e
^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(
1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*
a^2*b+1/4/d*e^2/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*co
t(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3
```

maxima [A] time = 0.78, size = 492, normalized size = 1.07

$$-\frac{\left(\frac{\left(3\,a^{4}-26\,a^{2}b^{2}+3\,b^{4}\right)e\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{6}+3\,a^{4}b^{2}+3\,a^{2}b^{4}+b^{6}\right)\sqrt{abe}}-\frac{\left(\frac{2\,\sqrt{2}\left(a^{3}-3\,a^{2}b-3\,ab^{2}+b^{3}\right)\arctan\left(\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{e}+2\,\sqrt{\frac{e}{\tan(dx+c)}}\right)}{2\,\sqrt{e}}\right)}{\sqrt{e}}+\frac{2\,\sqrt{2}\left(a^{3}-3\,a^{2}b-3\,ab^{2}+b^{3}\right)\arctan\left(-\frac{\sqrt{2}\left(\sqrt{2}\,\sqrt{\right.}\right.}{}\right.}{\sqrt{e}}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/4*((3*a^4 - 26*a^2*b^2 + 3*b^4)*e*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b
*e))/((a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)*sqrt(a*b*e)) - (2*sqrt(2)*(a^3 -
3*a^2*b - 3*a*b^2 + b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan
(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*ar
ctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(
e) + sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*log(sqrt(2)*sqrt(e)*sqrt(e/tan
(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2
 - b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqr
t(e))*e/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + ((5*a^3 - 3*a*b^2)*e^2*sqrt(e
/tan(d*x + c)) + (3*a^2*b - 5*b^3)*e*(e/tan(d*x + c))^(3/2))/((a^6 + 2*a^4*
b^2 + a^2*b^4)*e^2 + 2*(a^5*b + 2*a^3*b^3 + a*b^5)*e^2/tan(d*x + c) + (a^4*
b^2 + 2*a^2*b^4 + b^6)*e^2/tan(d*x + c)^2))*e/d
```

mupad [B] time = 6.21, size = 19000, normalized size = 41.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(3/2)/(a + b*cot(c + d*x))^3,x)
```

```
[Out] atan(((((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d^2*e^15
+ 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^2*e^15 -
 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d^5 + 8*a
^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*
b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*d^4*e^12 - 3
20*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12 + 51072*
a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*e^12 + 2
5344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12 - 1
28*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d
^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 +
 8*a^14*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2
+ a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b
^2*d^2)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^2
1*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10
*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 - 3840
0*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10 - 51
2*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d
^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 +
 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^
2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot
(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^5*b^
```

14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a^11*
b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*b^2*
d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6
*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2
d^4))((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a
^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*((e^3*1i)/(4*(b^6*d
^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*2
0i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 + 9*a^
12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 + 1671
*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 +
 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*
a^12*b^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2
*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(
1/2)*1i - (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d^2*e
^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^2*e^
15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d^5 +
 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a
^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*d^4*e^12
 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12 + 51
072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*e^12
 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12
 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^
12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d
^5 + 8*a^14*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b^6*d^2 - a^6*
d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a
^4*b^2*d^2)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4
*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*
a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 -
38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10
- 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^
12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d
^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*
b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e
*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^
5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a
^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*
b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56
*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14
*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i -
15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*((e^3*1i)/(4*(b
^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d
^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 +
9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 +
1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d
^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 +

28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5
*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)
))^(1/2)*1i)/((((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d
^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^
2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d
^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 +
56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*d^4*
e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12
+ 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*
e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*
e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^
4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b
^4*d^5 + 8*a^14*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b^6*d^2 -
a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i +
15*a^4*b^2*d^2)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920
*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21
504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^1
0 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e
^10 - 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^
4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b
^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i +
a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) -
((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 745
6*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 188
80*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a
^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4
+ 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*
a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6
i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*((e^3*1i)/(
4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b
^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(41*b^13*e^1
6 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^1
6 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^
14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d
^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a
*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*
d^2)))^(1/2) + (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*
d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d
^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*
d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 +
56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*d^4
*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12
+ 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4
*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4
*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a

^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10 - 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (28*a^2*b^8*e^18 - 15*b^10*e^18 + 878*a^4*b^6*e^18 - 180*a^6*b^4*e^18 + 9*a^8*b^2*e^18)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5)))*((e^3*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*2i + atan(((((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*d^4*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12 + 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 -

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38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10
- 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^
12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d
^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^
5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e
*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^
5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a
^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*
b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56
*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14
*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a
^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e^3/(4*(b^6*d^
2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^
3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 +
9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 +
1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d
^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 +
 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*
b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)
))^(1/2)*1i - (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d
^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^
2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d
^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 +
56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*d^4*
e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12
+ 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*
e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*
e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^
4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b
^4*d^5 + 8*a^14*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(e^3/(4*(b^6*d^2*1i - a^
6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a
^4*b^2*d^2*15i)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920
*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21
504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^1
0 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e
^10 - 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^
4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b
^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 +
6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) +
 ((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 745
6*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 188
80*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a
^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4
+ 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*
a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2
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 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e^3/(4*(b^
6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^
3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(41*b^13*e^1
6 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^1
6 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^
14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d
^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i +
6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*
15i)))^(1/2)*1i)/((((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^
13*d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^
7*d^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^
16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^
5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18*
d^4*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e
^12 + 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*
d^4*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*
d^4*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 2
8*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^
12*b^4*d^5 + 8*a^14*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(e^3/(4*(b^6*d^2*1i
- a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2
 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 1
7920*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10
+ 21504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4
*e^10 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d
^4*e^10 - 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 2
8*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^
12*b^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^
2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/
2) - ((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 -
 7456*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 +
 18880*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 +
 8*a^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*
d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4
+ 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b
*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e^3/(4
*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 2
0*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(41*b^13
*e^16 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7
*e^16 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^
2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b
^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1
i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*
d^2*15i)))^(1/2) + (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b
^13*d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b
^7*d^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b

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^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d
^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + (((4224*a^4*b^18
*d^4*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*
e^12 + 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10
*d^4*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4
*d^4*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 +
28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a
^12*b^4*d^5 + 8*a^14*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(e^3/(4*(b^6*d^2*1i
 - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^
2 + a^4*b^2*d^2*15i)))^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 +
17920*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10
 + 21504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^
4*e^10 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*
d^4*e^10 - 512*a^22*b^3*d^4*e^10))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 +
28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a
^12*b^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d
^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1
/2) + ((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13
- 7456*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13
+ 18880*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13
+ 8*a^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12
*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4
 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*
b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2))*(e^3/(
4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i -
20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(41*b^1
3*e^16 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^
7*e^16 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a
^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*
b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*
1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2
*d^2*15i)))^(1/2) + (28*a^2*b^8*e^18 - 15*b^10*e^18 + 878*a^4*b^6*e^18 - 18
0*a^6*b^4*e^18 + 9*a^8*b^2*e^18)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28
*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^1
2*b^4*d^5 + 8*a^14*b^2*d^5)))*(e^3/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^
2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/
2)*2i - (((e*cot(c + d*x))^(1/2)*(5*a^3*e^3 - 3*a*b^2*e^3))/(4*(a^4 + b^4 +
 2*a^2*b^2)) + (b*e^2*(e*cot(c + d*x))^(3/2)*(3*a^2 - 5*b^2))/(4*(a^4 + b^4
 + 2*a^2*b^2)))/(a^2*d*e^2 + b^2*d*e^2*cot(c + d*x)^2 + 2*a*b*d*e^2*cot(c +
 d*x)) + (atan((((((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 + 9*a^12*b*e^16 - 8
2*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 + 1671*a^8*b^5*e^16
 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*
d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4
+ 8*a^14*b^2*d^4) - (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*
b^13*d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*
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b^7*d^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + ((((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4) + (((4224*a^4*b^18*d^4*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12 + 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10 - 512*a^22*b^3*d^4*e^10))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)*(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2)*1i)/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)) + ((((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4) + (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4) - (((4224*a^4*b^18*d^4*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12 + 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56 *a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14 *b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3) ^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^21*d^4*e^1 0 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10*b^15*d^4 *e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 - 38400*a^16*b^ 9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10 - 512*a^22*b^ 3*d^4*e^10))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)*(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8 *d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3) ^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2)*1i)/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))/((28*a^2*b^8*e^18 - 15*b^10*e^18 + 878*a^4*b^6*e^18 - 180*a^6 *b^4*e^18 + 9*a^8*b^2*e^18)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4* b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4 *d^5 + 8*a^14*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(41*b^13*e^16 + 9*a^12*b *e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e^16 - 4348*a^6*b^7*e^16 + 1671*a^8 *b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28* a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12 *b^4*d^4 + 8*a^14*b^2*d^4) - (((518*a*b^15*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d^2*e^15 + 3022*a^5*b^11*d^2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^2*e^15 - 3338*a^11*b^5*d^2*e^15 + 506*a^13*b^3*d^2*e^15)/(a^ 16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70 *a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) + ((((e* cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13 + 64*a^3*b^16*d^2*e^13 - 7456*a^5 *b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 + 19504*a^9*b^10*d^2*e^13 + 18880*a^ 11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13 - 960*a^15*b^4*d^2*e^13 + 8*a^17*b ^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56* a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14* b^2*d^4) + (((4224*a^4*b^18*d^4*e^12 - 320*a^2*b^20*d^4*e^12 - 192*b^22*d^4 *e^12 + 22272*a^6*b^16*d^4*e^12 + 51072*a^8*b^14*d^4*e^12 + 67200*a^10*b^12 *d^4*e^12 + 53760*a^12*b^10*d^4*e^12 + 25344*a^14*b^8*d^4*e^12 + 5952*a^16* b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12 - 128*a^20*b^2*d^4*e^12)/(a^16*d^5 + b ^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d ^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 + 8*a^14*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^21*d^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10*b^15*d^4*e^10 - 21504*a^12*b^13*d^4* e^10 - 46080*a^14*b^11*d^4*e^10 - 38400*a^16*b^9*d^4*e^10 - 17920*a^18*b^7* d^4*e^10 - 4608*a^20*b^5*d^4*e^10 - 512*a^22*b^3*d^4*e^10))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)*(a^16*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28* a^12*b^4*d^4 + 8*a^14*b^2*d^4)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1

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/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 -
26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7
*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*
a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1
/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)) + ((((e*cot(c + d*
x))^(1/2)*(41*b^13*e^16 + 9*a^12*b*e^16 - 82*a^2*b^11*e^16 + 1831*a^4*b^9*e
^16 - 4348*a^6*b^7*e^16 + 1671*a^8*b^5*e^16 - 210*a^10*b^3*e^16))/(a^16*d^4
 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b
^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4) + (((518*a*b^1
5*d^2*e^15 - 18*a^15*b*d^2*e^15 - 4494*a^3*b^13*d^2*e^15 + 3022*a^5*b^11*d^
2*e^15 + 17194*a^7*b^9*d^2*e^15 + 5298*a^9*b^7*d^2*e^15 - 3338*a^11*b^5*d^2
*e^15 + 506*a^13*b^3*d^2*e^15)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a
^4*b^12*d^5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*
b^4*d^5 + 8*a^14*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(1544*a*b^18*d^2*e^13
 + 64*a^3*b^16*d^2*e^13 - 7456*a^5*b^14*d^2*e^13 - 576*a^7*b^12*d^2*e^13 +
19504*a^9*b^10*d^2*e^13 + 18880*a^11*b^8*d^2*e^13 + 3808*a^13*b^6*d^2*e^13
- 960*a^15*b^4*d^2*e^13 + 8*a^17*b^2*d^2*e^13))/(a^16*d^4 + b^16*d^4 + 8*a^
2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a^8*b^8*d^4 + 56*a^10*b
^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4) - (((4224*a^4*b^18*d^4*e^12 - 32
0*a^2*b^20*d^4*e^12 - 192*b^22*d^4*e^12 + 22272*a^6*b^16*d^4*e^12 + 51072*a
^8*b^14*d^4*e^12 + 67200*a^10*b^12*d^4*e^12 + 53760*a^12*b^10*d^4*e^12 + 25
344*a^14*b^8*d^4*e^12 + 5952*a^16*b^6*d^4*e^12 + 192*a^18*b^4*d^4*e^12 - 12
8*a^20*b^2*d^4*e^12)/(a^16*d^5 + b^16*d^5 + 8*a^2*b^14*d^5 + 28*a^4*b^12*d^
5 + 56*a^6*b^10*d^5 + 70*a^8*b^8*d^5 + 56*a^10*b^6*d^5 + 28*a^12*b^4*d^5 +
8*a^14*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*
b*e^3)^(1/2)*(512*b^25*d^4*e^10 + 4608*a^2*b^23*d^4*e^10 + 17920*a^4*b^21*d
^4*e^10 + 38400*a^6*b^19*d^4*e^10 + 46080*a^8*b^17*d^4*e^10 + 21504*a^10*b^
15*d^4*e^10 - 21504*a^12*b^13*d^4*e^10 - 46080*a^14*b^11*d^4*e^10 - 38400*a
^16*b^9*d^4*e^10 - 17920*a^18*b^7*d^4*e^10 - 4608*a^20*b^5*d^4*e^10 - 512*a
^22*b^3*d^4*e^10))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)*(a^16
*d^4 + b^16*d^4 + 8*a^2*b^14*d^4 + 28*a^4*b^12*d^4 + 56*a^6*b^10*d^4 + 70*a
^8*b^8*d^4 + 56*a^10*b^6*d^4 + 28*a^12*b^4*d^4 + 8*a^14*b^2*d^4)))*(3*a^4 +
 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^
7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b
^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*
b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d)))*(3*a^4 +
 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2))/(8*(3*a^3*b^5*d + 3*a^5*b^3*d + a*b^
7*d + a^7*b*d))))*(3*a^4 + 3*b^4 - 26*a^2*b^2)*(-a*b*e^3)^(1/2)*1i)/(4*(3*a
^3*b^5*d + 3*a^5*b^3*d + a*b^7*d + a^7*b*d))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cot(c+dx))^{\frac{3}{2}}}{(a+b\cot(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(3/2)/(a+b*cot(d*x+c))**3,x)
[Out] Integral((e*cot(c + d*x))**(3/2)/(a + b*cot(c + d*x))**3, x)
```

3.85 $\int \frac{\sqrt{e\cot(c+dx)}}{(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=463

$$\frac{b(7a^2-b^2)\sqrt{e\cot(c+dx)}}{4ad(a^2+b^2)^2(a+b\cot(c+dx))}+\frac{b\sqrt{e\cot(c+dx)}}{2d(a^2+b^2)(a+b\cot(c+dx))^2}-\frac{\sqrt{e}(a+b)(a^2-4ab+b^2)\log\left(\sqrt{e}\cot(c+ \cdots\right.}{2\sqrt{2}d(a^2+b^2 \cdots}$$

```
[Out] 1/2*(a-b)*(a^2+4*a*b+b^2)*arctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))*e^
(1/2)/(a^2+b^2)^3/d*2^(1/2)-1/2*(a-b)*(a^2+4*a*b+b^2)*arctan(1+2^(1/2)*(e*c
ot(d*x+c))^(1/2)/e^(1/2))*e^(1/2)/(a^2+b^2)^3/d*2^(1/2)-1/4*(a+b)*(a^2-4*a*
b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/
(a^2+b^2)^3/d*2^(1/2)+1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/
2)+2^(1/2)*(e*cot(d*x+c))^(1/2))*e^(1/2)/(a^2+b^2)^3/d*2^(1/2)+1/4*(15*a^4-
18*a^2*b^2-b^4)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*b^(1/2
)*e^(1/2)/a^(3/2)/(a^2+b^2)^3/d+1/2*b*(e*cot(d*x+c))^(1/2)/(a^2+b^2)/d/(a+b
*cot(d*x+c))^2+1/4*b*(7*a^2-b^2)*(e*cot(d*x+c))^(1/2)/a/(a^2+b^2)^2/d/(a+b*
cot(d*x+c))
```

Rubi [A] time = 1.15, antiderivative size = 463, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3568, 3649, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{b(7a^2-b^2)\sqrt{e\cot(c+dx)}}{4ad(a^2+b^2)^2(a+b\cot(c+dx))}+\frac{b\sqrt{e\cot(c+dx)}}{2d(a^2+b^2)(a+b\cot(c+dx))^2}-\frac{\sqrt{e}(a+b)(a^2-4ab+b^2)\log\left(\sqrt{e}\cot(c+ \cdots\right.}{2\sqrt{2}d(a^2+b^2 \cdots}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cot[c + d*x]]/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] (Sqrt[b]*(15*a^4 - 18*a^2*b^2 - b^4)*Sqrt[e]*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c +
 d*x]])/(Sqrt[a]*Sqrt[e])])/(4*a^(3/2)*(a^2 + b^2)^3*d) + ((a - b)*(a^2 + 4
*a*b + b^2)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sq
rt[2]*(a^2 + b^2)^3*d) - ((a - b)*(a^2 + 4*a*b + b^2)*Sqrt[e]*ArcTan[1 + (S
qrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d) + (b*Sqrt[
e*Cot[c + d*x]])/(2*(a^2 + b^2)*d*(a + b*Cot[c + d*x])^2) + (b*(7*a^2 - b^2
)*Sqrt[e*Cot[c + d*x]])/(4*a*(a^2 + b^2)^2*d*(a + b*Cot[c + d*x])) - ((a +
b)*(a^2 - 4*a*b + b^2)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] - Sqrt[2]
*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d) + ((a + b)*(a^2 - 4*a*b
 + b^2)*Sqrt[e]*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[e*Cot[c +
 d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d)
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3568

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(a + b*Tan[e + f*x])^(m + 1)*(c +
d*Tan[e + f*x])^n)/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/((m + 1)*(a^2 + b^2
)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n - 1)*Simp[a*c*
(m + 1) - b*d*n - (b*c - a*d)*(m + 1)*Tan[e + f*x] - b*d*(m + n + 1)*Tan[e
+ f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &
& NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] && GtQ[n, 0] && Inte
gerQ[2*m]
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
```

```
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{\sqrt{e\cot(c+dx)}}{(a+b\cot(c+dx))^3}\,dx = \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} - \frac{\int \frac{-\frac{be}{2}-2ae\cot(c+dx)+\frac{3}{2}be\cot^2(c+dx)}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2}\,dx}{2\left(a^2+b^2\right)}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{b\left(7a^2-b^2\right)\sqrt{e\cot(c+dx)}}{4a\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\int \frac{\frac{1}{4}b\left(9a^2+b^2\right)e}{\ldots}}{\ldots}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{b\left(7a^2-b^2\right)\sqrt{e\cot(c+dx)}}{4a\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\int \frac{2ab\left(3a^2-b^2\right)e}{\ldots}}{2\ldots}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{b\left(7a^2-b^2\right)\sqrt{e\cot(c+dx)}}{4a\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\text{Subst}\left(\int \frac{-2a}{\ldots}\right.}{\ldots}$$

$$= \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{b\left(7a^2-b^2\right)\sqrt{e\cot(c+dx)}}{4a\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \frac{\left(b\left(15a^4-18\ldots\right.\right.}{\ldots}$$

$$= \frac{\sqrt{b}\left(15a^4-18a^2b^2-b^4\right)\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4a^{3/2}\left(a^2+b^2\right)^3 d} + \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))\ldots}$$

$$= \frac{\sqrt{b}\left(15a^4-18a^2b^2-b^4\right)\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4a^{3/2}\left(a^2+b^2\right)^3 d} + \frac{b\sqrt{e\cot(c+dx)}}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))\ldots}$$

$$= \frac{\sqrt{b}\left(15a^4-18a^2b^2-b^4\right)\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4a^{3/2}\left(a^2+b^2\right)^3 d} + \frac{(a-b)\left(a^2+4ab+b^2\right)\sqrt{e}\,\tan\ldots}{\sqrt{2}\left(a^2+b^2\ldots\right.}$$

Mathematica [C] time = 6.19, size = 483, normalized size = 1.04

$$-\frac{\sqrt{e\cot(c+dx)}\left(\frac{2a\left(a^2-3b^2\right)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)}{3\left(a^2+b^2\right)^3} + \frac{2b\left(3a^2-b^2\right)\sqrt{\cot(c+dx)}}{\left(a^2+b^2\right)^3} - \frac{2\sqrt{a}\sqrt{b}\left(3a^2-b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)}{\left(a^2+b^2\right)^3} - \frac{2\ldots}{\ldots}\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cot[c + d*x]]/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] -((Sqrt[e*Cot[c + d*x]]*((-2*Sqrt[a]*Sqrt[b]*(3*a^2 - b^2)*ArcTan[(Sqrt[b]*
Sqrt[Cot[c + d*x]])/Sqrt[a]])/(a^2 + b^2)^3 + (2*b*(3*a^2 - b^2)*Sqrt[Cot[c
 + d*x]])/(a^2 + b^2)^3 - (2*Sqrt[a]*Sqrt[b]*(-(a*ArcTan[(Sqrt[b]*Sqrt[Cot[
c + d*x]])/Sqrt[a]]) + Sqrt[a]*Sqrt[b]*Sqrt[Cot[c + d*x]] - b*ArcTan[(Sqrt[
b]*Sqrt[Cot[c + d*x]])/Sqrt[a]]*Cot[c + d*x]))/((a^2 + b^2)^2*(a + b*Cot[c
+ d*x])) + (2*a*(a^2 - 3*b^2)*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1,
7/4, -Cot[c + d*x]^2])/(3*(a^2 + b^2)^3) + (2*b^2*Cot[c + d*x]^(3/2)*Hyperg
eometric2F1[3/2, 3, 5/2, -((b*Cot[c + d*x])/a)])/(3*a^3*(a^2 + b^2)) - (b*(
3*a^2 - b^2)*(2*(Sqrt[2]*ArcTan[1 - Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*A
rcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]]) + 8*Sqrt[Cot[c + d*x]] + Sqrt[2]*Log
[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Sqrt[2]*Log[1 + Sqrt[2]*S
qrt[Cot[c + d*x]] + Cot[c + d*x]]))/(4*(a^2 + b^2)^3)))/(d*Sqrt[Cot[c + d*x
]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \cot (dx + c)}}{(b \cot (dx + c) + a)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cot(d*x + c))/(b*cot(d*x + c) + a)^3, x)
```

maple [B] time = 0.97, size = 1187, normalized size = 2.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] 7/4/d*e*b^2/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*a^3*(e*cot(d*x+c))^(3/2)+3/2
/d*e*b^4/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*a*(e*cot(d*x+c))^(3/2)-1/4/d*e*
b^6/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2/a*(e*cot(d*x+c))^(3/2)+9/4/d*e^2*b/(
a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)*a^4+5/2/d*e^2*b^3/(a
```

```
^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)*a^2+1/4/d*e^2*b^5/(a^
2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)+15/4/d*e*b/(a^2+b^2)^3
*a^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-9/2/d*e*b^3
/(a^2+b^2)^3*a/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-1
/4/d*e*b^5/(a^2+b^2)^3/a/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b
)^(1/2))+3/2/d/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(
-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3-3/4/d/(a^2+b^2)^3*(e^2)^(1
/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)
^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
)*a^2*b+1/4/d/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3-3/2/d/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/
2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d/(a^2+b^2)
^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b
^3+1/2/d*e/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)+1)*a^3-3/2/d*e/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(
1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2-1/4/d*e/(a^2+b^2)^3*2^(1/2)/
(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)
^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))
)*a^3+3/4/d*e/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*
(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(
d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*b^2-1/2/d*e/(a^2+b^2)^3*2^(1/2)/(e^2)
^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d*e/(a^2+
b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)*a*b^2
```

maxima [A] time = 0.84, size = 496, normalized size = 1.07

$$e\left(\frac{\left(15\,a^4b-18\,a^2b^3-b^5\right)\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^7+3\,a^5b^2+3\,a^3b^4+ab^6\right)\sqrt{abe}}+\frac{\left(9\,a^3b+ab^3\right)e\sqrt{\frac{e}{\tan(dx+c)}}+\left(7\,a^2b^2-b^4\right)\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}{\left(a^7+2\,a^5b^2+a^3b^4\right)e^2+\frac{2\left(a^6b+2\,a^4b^3+a^2b^5\right)e^2}{\tan(dx+c)}+\frac{\left(a^5b^2+2\,a^3b^4+ab^6\right)e^2}{\tan(dx+c)^2}}-\frac{2\,\sqrt{2}\left(a^3+3\,a^2b-3\,ab^2-b^3\right)\arctan\left(\frac{\sqrt{2}\cdots}{\cdots}\right)}{\sqrt{e}}\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/4*e*((15*a^4*b - 18*a^2*b^3 - b^5)*arctan(b*sqrt(e/tan(d*x + c))/sqrt(a*b
*e))/((a^7 + 3*a^5*b^2 + 3*a^3*b^4 + a*b^6)*sqrt(a*b*e)) + ((9*a^3*b + a*b^
3)*e*sqrt(e/tan(d*x + c)) + (7*a^2*b^2 - b^4)*(e/tan(d*x + c))^(3/2))/((a^7
 + 2*a^5*b^2 + a^3*b^4)*e^2 + 2*(a^6*b + 2*a^4*b^3 + a^2*b^5)*e^2/tan(d*x +
```

```
 c) + (a^5*b^2 + 2*a^3*b^4 + a*b^6)*e^2/tan(d*x + c)^2) - (2*sqrt(2)*(a^3 +
 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/ta
n(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*a
rctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt
(e) - sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(sqrt(2)*sqrt(e)*sqrt(e/ta
n(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) + sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^
2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sq
rt(e))/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6))/d
```

mupad [B] time = 6.13, size = 19534, normalized size = 42.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cot(c + d*x))^(1/2)/(a + b*cot(c + d*x))^3,x)
```

```
[Out] (((e*cot(c + d*x))^(1/2)*(b^3*e^2 + 9*a^2*b*e^2))/(4*(a^4 + b^4 + 2*a^2*b^2
)) + (b^2*e*(e*cot(c + d*x))^(3/2)*(7*a^2 - b^2))/(4*a*(a^4 + b^4 + 2*a^2*b
^2)))/(a^2*d*e^2 + b^2*d*e^2*cot(c + d*x)^2 + 2*a*b*d*e^2*cot(c + d*x)) - a
tan((((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e
^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d
^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^
7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^
2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b
^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + ((e*cot(c +
d*x))^(1/2)*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a
^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*a^2*b^25*d^
4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*
d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14
*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920
*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(a^18
*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 +
70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/
(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i -
 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(8*a*b
^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*
b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^
13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b
^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 +
 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*
a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2
- a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - (2*b^18*d^2
*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*
e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*
e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*
```

d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i - (((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*1i)/((7*a*b^11*e^13 + 116*a^3*b^9*e^13 - 270*a^5*b^7*e^13 + 4

20*a^7*b^5*e^13 - 225*a^9*b^3*e^13)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + (((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) + (((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*

b^2*d^2*15i)))^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 1792
0*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 +
21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e
^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4
*e^10 - 512*a^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 +
28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28
*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*
d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(
1/2) + ((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11
+ 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^1
1 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11
+ 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4
+ 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 5
6*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e/(4*(b^6*d^2*1i - a^
6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a
^4*b^2*d^2*15i)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a
^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a
^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^1
6*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5
+ 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 +
8*a^16*b^2*d^5))*(-e/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^
2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2) - ((e*cot(c
+ d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b
^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^1
8*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 +
70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-e
/(4*(b^6*d^2*1i - a^6*d^2*1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i
- 20*a^3*b^3*d^2 + a^4*b^2*d^2*15i)))^(1/2)))*(-e/(4*(b^6*d^2*1i - a^6*d^2*
1i + 6*a*b^5*d^2 + 6*a^5*b*d^2 - a^2*b^4*d^2*15i - 20*a^3*b^3*d^2 + a^4*b^2
*d^2*15i)))^(1/2)*2i - atan((((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^
11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*
e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*
d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*
d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*
a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16
*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*
d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2))
)^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^
4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^
15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a
^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a
^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*
d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4
+ 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d
^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*co

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t(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^
16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11
*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*
b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14
*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^
4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b
^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^
2)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e
^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e
^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^1
2)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^1
0*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^
5))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b
^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2
)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 363
1*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b
^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*
d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6
*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2
*20i + 15*a^4*b^2*d^2)))^(1/2)*1i - (((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21
*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^
15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^
15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^
21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^
5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 +
 8*a^16*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 +
 a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^
2*d^2)))^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*
b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*
a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 -
38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10
- 512*a^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^
6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*
b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i +
a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) +
 ((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528
*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 50
56*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 180
0*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a
^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12
*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^
2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4
*b^2*d^2)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^1
4*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^
8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*
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d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*
a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16
*b^2*d^5))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 1
5*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x
))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^1
2 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4
+ a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^
10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/
(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*
b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*1i)/((7*a*b^11*e^13 + 116*a^3*b^9*e^1
3 - 270*a^5*b^7*e^13 + 420*a^7*b^5*e^13 - 225*a^9*b^3*e^13)/(a^18*d^5 + a^2
*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^
8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + (((((64*a*b^2
3*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^
17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^
13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*
a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4
*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b
^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(-(e*1
i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a
^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*
b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a
^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 4
6080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10
 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^
4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 +
56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 -
 a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i +
 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 115
2*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14
128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 +
64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^1
8*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 +
 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(
e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2
- a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^
16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^
10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b
^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d
^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5
+ 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5
*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)
))^(1/2) + ((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^
11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*
a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4
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+ 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + (((((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) + ((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - (2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2) - ((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)))*(-(e*1i)/(4*(b^6*d^2 - a^6*d^2 + a*b^5*d^2*6i + a^5*b*d^2*6i - 15*a^2*b^4*d^2 - a^3*b^3*d^2*20i + 15*a^4*b^2*d^2)))^(1/2)*2i - (atan((((((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4) + (((2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2

*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2
*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16
*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5
 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((((e*cot(c + d*x)
)^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^1
1 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*
e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^
11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*
a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^1
4*b^4*d^4 + 8*a^16*b^2*d^4) + (((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^1
1 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e
^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d
^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d
^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a
^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*
b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(
1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e
^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*
d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18
*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24
*b^3*d^4*e^10))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)*(a^18*d^
4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*
a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4)))*(b^4 -
 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d
 + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d +
 a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3
*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15
*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2)*1i)/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d
 + 3*a^7*b^2*d)) + ((((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 +
 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e
^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^
6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*
b^4*d^4 + 8*a^16*b^2*d^4) - (((2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 30
46*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 52
46*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32
*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12
*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^
5 + 8*a^16*b^2*d^5) + ((((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a
^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128
*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*
a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d
^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70
*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4) - (((64
*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*
a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10

752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)*(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2)*1i)/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))/((7*a*b^11*e^13 + 116*a^3*b^9*e^13 - 270*a^5*b^7*e^13 + 420*a^7*b^5*e^13 - 225*a^9*b^3*e^13)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(2*a^2*b^13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4) + (((2*b^18*d^2*e^12 - 138*a^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(8*a*b^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4) + (((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 10176*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2)*(512*a^2*b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 21504*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10 - 17920*a^20*b^7*d^4*e^10 - 4608*a^22

```
*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d
 + 3*a^7*b^2*d)*(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4
 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 +
8*a^16*b^2*d^4)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d +
 a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3
*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15
*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d +
3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^
3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)) + ((((e*cot(c + d*x))^(1/2)*(2*a^2*b^
13*e^12 - b^15*e^12 + 49*a^4*b^11*e^12 + 2460*a^6*b^9*e^12 - 3631*a^8*b^7*e
^12 + 1922*a^10*b^5*e^12 - 225*a^12*b^3*e^12))/(a^18*d^4 + a^2*b^16*d^4 + 8
*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^
12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4) - (((2*b^18*d^2*e^12 - 138*a
^2*b^16*d^2*e^12 - 3046*a^4*b^14*d^2*e^12 + 4862*a^6*b^12*d^2*e^12 + 9222*a
^8*b^10*d^2*e^12 - 5246*a^10*b^8*d^2*e^12 - 4290*a^12*b^6*d^2*e^12 + 2442*a
^14*b^4*d^2*e^12 + 32*a^16*b^2*d^2*e^12)/(a^18*d^5 + a^2*b^16*d^5 + 8*a^4*b
^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 + 70*a^10*b^8*d^5 + 56*a^12*b^6
*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + ((((e*cot(c + d*x))^(1/2)*(8*a*b
^20*d^2*e^11 - 1152*a^3*b^18*d^2*e^11 + 2528*a^5*b^16*d^2*e^11 + 15296*a^7*
b^14*d^2*e^11 + 14128*a^9*b^12*d^2*e^11 - 5056*a^11*b^10*d^2*e^11 - 9248*a^
13*b^8*d^2*e^11 + 64*a^15*b^6*d^2*e^11 + 1800*a^17*b^4*d^2*e^11 + 64*a^19*b
^2*d^2*e^11))/(a^18*d^4 + a^2*b^16*d^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 +
 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 + 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*
a^16*b^2*d^4) - (((64*a*b^23*d^4*e^11 + 1472*a^3*b^21*d^4*e^11 + 8832*a^5*b
^19*d^4*e^11 + 25344*a^7*b^17*d^4*e^11 + 40320*a^9*b^15*d^4*e^11 + 34944*a^
11*b^13*d^4*e^11 + 10752*a^13*b^11*d^4*e^11 - 8448*a^15*b^9*d^4*e^11 - 1017
6*a^17*b^7*d^4*e^11 - 4160*a^19*b^5*d^4*e^11 - 640*a^21*b^3*d^4*e^11)/(a^18
*d^5 + a^2*b^16*d^5 + 8*a^4*b^14*d^5 + 28*a^6*b^12*d^5 + 56*a^8*b^10*d^5 +
70*a^10*b^8*d^5 + 56*a^12*b^6*d^5 + 28*a^14*b^4*d^5 + 8*a^16*b^2*d^5) + ((e
*cot(c + d*x))^(1/2)*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2)*(512*a^2*
b^25*d^4*e^10 + 4608*a^4*b^23*d^4*e^10 + 17920*a^6*b^21*d^4*e^10 + 38400*a^
8*b^19*d^4*e^10 + 46080*a^10*b^17*d^4*e^10 + 21504*a^12*b^15*d^4*e^10 - 215
04*a^14*b^13*d^4*e^10 - 46080*a^16*b^11*d^4*e^10 - 38400*a^18*b^9*d^4*e^10
- 17920*a^20*b^7*d^4*e^10 - 4608*a^22*b^5*d^4*e^10 - 512*a^24*b^3*d^4*e^10)
)/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)*(a^18*d^4 + a^2*b^16*d
^4 + 8*a^4*b^14*d^4 + 28*a^6*b^12*d^4 + 56*a^8*b^10*d^4 + 70*a^10*b^8*d^4 +
 56*a^12*b^6*d^4 + 28*a^14*b^4*d^4 + 8*a^16*b^2*d^4)))*(b^4 - 15*a^4 + 18*a
^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d
)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3
*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2))/(
8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))*(b^4 - 15*a^4 + 18*a^2*
b^2)*(-a^3*b*e)^(1/2))/(8*(a^9*d + a^3*b^6*d + 3*a^5*b^4*d + 3*a^7*b^2*d)))
)*(b^4 - 15*a^4 + 18*a^2*b^2)*(-a^3*b*e)^(1/2)*1i)/(4*(a^9*d + a^3*b^6*d +
3*a^5*b^4*d + 3*a^7*b^2*d))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cot(c+dx)}}{(a+b\cot(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cot(d*x+c))**(1/2)/(a+b*cot(d*x+c))**3,x)
[Out] Integral(sqrt(e*cot(c + d*x))/(a + b*cot(c + d*x))**3, x)
```

3.86 $\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=476

$$-\frac{b^2\left(11a^2+3b^2\right)\sqrt{e\cot(c+dx)}}{4a^2de\left(a^2+b^2\right)^2(a+b\cot(c+dx))}-\frac{b^2\sqrt{e\cot(c+dx)}}{2ade\left(a^2+b^2\right)(a+b\cot(c+dx))^2}+\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c\right.}{2\sqrt{2}\,d\sqrt{e}\,\left(a^2\right.}$$

```
[Out] -1/4*b^(3/2)*(35*a^4+6*a^2*b^2+3*b^4)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/a
^(1/2)/e^(1/2))/a^(5/2)/(a^2+b^2)^3/d/e^(1/2)+1/2*(a+b)*(a^2-4*a*b+b^2)*arc
tan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^3/d*2^(1/2)/e^(1/2)-1
/2*(a+b)*(a^2-4*a*b+b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^
2+b^2)^3/d*2^(1/2)/e^(1/2)+1/4*(a-b)*(a^2+4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*
e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^3/d*2^(1/2)/e^(1/2)-1/4*(a-
b)*(a^2+4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1/
2))/(a^2+b^2)^3/d*2^(1/2)/e^(1/2)-1/2*b^2*(e*cot(d*x+c))^(1/2)/a/(a^2+b^2)/
d/e/(a+b*cot(d*x+c))^2-1/4*b^2*(11*a^2+3*b^2)*(e*cot(d*x+c))^(1/2)/a^2/(a^2
+b^2)^2/d/e/(a+b*cot(d*x+c))
```

Rubi [A] time = 1.24, antiderivative size = 476, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3569, 3649, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$-\frac{b^2\left(11a^2+3b^2\right)\sqrt{e\cot(c+dx)}}{4a^2de\left(a^2+b^2\right)^2(a+b\cot(c+dx))}-\frac{b^2\sqrt{e\cot(c+dx)}}{2ade\left(a^2+b^2\right)(a+b\cot(c+dx))^2}+\frac{(a-b)\left(a^2+4ab+b^2\right)\log\left(\sqrt{e}\cot(c\right.}{2\sqrt{2}\,d\sqrt{e}\,\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^3),x]
```

```
[Out] -(b^(3/2)*(35*a^4 + 6*a^2*b^2 + 3*b^4)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]]
)/(Sqrt[a]*Sqrt[e])])/(4*a^(5/2)*(a^2 + b^2)^3*d*Sqrt[e]) + ((a + b)*(a^2 -
 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*
(a^2 + b^2)^3*d*Sqrt[e]) - ((a + b)*(a^2 - 4*a*b + b^2)*ArcTan[1 + (Sqrt[2]
*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d*Sqrt[e]) - (b^2*S
qrt[e*Cot[c + d*x]])/(2*a*(a^2 + b^2)*d*e*(a + b*Cot[c + d*x])^2) - (b^2*(1
1*a^2 + 3*b^2)*Sqrt[e*Cot[c + d*x]])/(4*a^2*(a^2 + b^2)^2*d*e*(a + b*Cot[c
+ d*x])) + ((a - b)*(a^2 + 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x]
- Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d*Sqrt[e]) - ((a
- b)*(a^2 + 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sqrt[
e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d*Sqrt[e])
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
```

```
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^3}\,dx = -\frac{b^2\sqrt{e\cot(c+dx)}}{2a\left(a^2+b^2\right)de(a+b\cot(c+dx))^2} - \frac{\int \frac{-\frac{1}{2}\left(4a^2+3b^2\right)e+2abe\cot(c+dx)-\frac{3}{2}b^2e}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx)}}{2a\left(a^2+b^2\right)e}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{2a\left(a^2+b^2\right)de(a+b\cot(c+dx))^2} - \frac{b^2\left(11a^2+3b^2\right)\sqrt{e\cot(c+d}}{4a^2\left(a^2+b^2\right)^2 de(a+b\cot(c+}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{2a\left(a^2+b^2\right)de(a+b\cot(c+dx))^2} - \frac{b^2\left(11a^2+3b^2\right)\sqrt{e\cot(c+d}}{4a^2\left(a^2+b^2\right)^2 de(a+b\cot(c+}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{2a\left(a^2+b^2\right)de(a+b\cot(c+dx))^2} - \frac{b^2\left(11a^2+3b^2\right)\sqrt{e\cot(c+d}}{4a^2\left(a^2+b^2\right)^2 de(a+b\cot(c+}$$

$$= -\frac{b^2\sqrt{e\cot(c+dx)}}{2a\left(a^2+b^2\right)de(a+b\cot(c+dx))^2} - \frac{b^2\left(11a^2+3b^2\right)\sqrt{e\cot(c+d}}{4a^2\left(a^2+b^2\right)^2 de(a+b\cot(c+}$$

$$= -\frac{b^{3/2}\left(35a^4+6a^2b^2+3b^4\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{4a^{5/2}\left(a^2+b^2\right)^3 d\sqrt{e}} - \frac{b^2\sqrt{e\cot}}{2a\left(a^2+b^2\right)de(a}$$

$$= -\frac{b^{3/2}\left(35a^4+6a^2b^2+3b^4\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{4a^{5/2}\left(a^2+b^2\right)^3 d\sqrt{e}} - \frac{b^2\sqrt{e\cot}}{2a\left(a^2+b^2\right)de(a}$$

$$= -\frac{b^{3/2}\left(35a^4+6a^2b^2+3b^4\right)\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{e\cot(c+dx)}}{\sqrt{a}\,\sqrt{e}}\right)}{4a^{5/2}\left(a^2+b^2\right)^3 d\sqrt{e}} + \frac{(a+b)\left(a^2-4ab\right.}{\sqrt{2}}$$

Mathematica [C] time = 6.13, size = 411, normalized size = 0.86

$$-\frac{\sqrt{\cot(c+dx)}\left(-\frac{2b\left(3a^2-b^2\right)\cot^{\frac{3}{2}}(c+dx)\,{}_2F_1\left(\frac{3}{4},1;\frac{7}{4};-\cot^2(c+dx)\right)}{3\left(a^2+b^2\right)^3}+\frac{2b^2\sqrt{\cot(c+dx)}\left(\frac{a}{a+b\cot(c+dx)}+\frac{\sqrt{a}\tan^{-1}\left(\frac{\sqrt{b}\,\sqrt{\cot(c+dx)}}{\sqrt{a}}\right)}{\sqrt{b}\,\sqrt{\cot(c+dx)}}\right)}{a\left(a^2+b^2\right)^2}-\frac{a\left(a^2-3b^2\right)(2}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^3),x]
```

```
[Out] -((Sqrt[Cot[c + d*x]]*((2*b^(3/2)*(3*a^2 - b^2)*ArcTan[(Sqrt[b]*Sqrt[Cot[c
+ d*x]])/Sqrt[a]])/(Sqrt[a]*(a^2 + b^2)^3) + (2*b^2*Sqrt[Cot[c + d*x]]*((Sq
rt[a]*ArcTan[(Sqrt[b]*Sqrt[Cot[c + d*x]])/Sqrt[a]])/(Sqrt[b]*Sqrt[Cot[c + d
*x]]) + a/(a + b*Cot[c + d*x])))/(a*(a^2 + b^2)^2) + (2*b^2*Sqrt[Cot[c + d*
x]]*Hypergeometric2F1[1/2, 3, 3/2, -((b*Cot[c + d*x])/a)])/(a^3*(a^2 + b^2)
) - (2*b*(3*a^2 - b^2)*Cot[c + d*x]^(3/2)*Hypergeometric2F1[3/4, 1, 7/4, -C
ot[c + d*x]^2])/(3*(a^2 + b^2)^3) - (a*(a^2 - 3*b^2)*(4*(Sqrt[2]*ArcTan[1 -
 Sqrt[2]*Sqrt[Cot[c + d*x]]] - Sqrt[2]*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]
]]) + 2*Sqrt[2]*Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - 2*Sqrt
[2]*Log[1 + Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]]))/(8*(a^2 + b^2)^3))
)/(d*Sqrt[e*Cot[c + d*x]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(b\cot(dx+c)+a)^3\sqrt{e\cot(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)^3*sqrt(e*cot(d*x + c))), x)
```

maple [B] time = 0.84, size = 1190, normalized size = 2.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] -11/4/d*b^3/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*a^2*(e*cot(d*x+c))^(3/2)-7/2
/d*b^5/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)-3/4/d*b^7/(a
^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2/a^2*(e*cot(d*x+c))^(3/2)-13/4/d*e*b^2/(a^2
+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*a^3*(e*cot(d*x+c))^(1/2)-9/2/d*e*b^4/(a^2+b^
2)^3/(e*cot(d*x+c)*b+a*e)^2*a*(e*cot(d*x+c))^(1/2)-5/4/d*e*b^6/(a^2+b^2)^3/
```

```
(e*cot(d*x+c)*b+a*e)^2/a*(e*cot(d*x+c))^(1/2)-35/4/d*b^2/(a^2+b^2)^3*a^2/(a
*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-3/2/d*b^4/(a^2+b^2
)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))-3/4/d*b^6/(a
^2+b^2)^3/a^2/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+1/
2/d/e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*
x+c))^(1/2)+1)*a^3-3/2/d/e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2-1/2/d/e/(a^2+b^2)^3*(e^2)^(1/4)*2
^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d/e/(a^2+
b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)*a*b^2-1/4/d/e/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/
4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*c
ot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^3+3/4/d/e/(a^2+b^2)^3*(e^2)^(1/4)*
2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/
2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a*
b^2-3/2/d/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*co
t(d*x+c))^(1/2)+1)*a^2*b+1/2/d/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1
/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+3/2/d/(a^2+b^2)^3*2^(1/2)/(e^2)
^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2*b-1/2/d/(a^2+
b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+
1)*b^3+3/4/d/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(
e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d
*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^2*b-1/4/d/(a^2+b^2)^3*2^(1/2)/(e^2)^(1
/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/
(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3
```

maxima [A] time = 0.48, size = 510, normalized size = 1.07

$$-\frac{e\left(\frac{\left(13\,a^{3}b^{2}+5\,ab^{4}\right)e\sqrt{\frac{e}{\tan(dx+c)}}+\left(11\,a^{2}b^{3}+3\,b^{5}\right)\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}}{\left(a^{8}+2\,a^{6}b^{2}+a^{4}b^{4}\right)e^{3}+\frac{2\left(a^{7}b+2\,a^{5}b^{3}+a^{3}b^{5}\right)e^{3}}{\tan(dx+c)}+\frac{\left(a^{6}b^{2}+2\,a^{4}b^{4}+a^{2}b^{6}\right)e^{3}}{\tan(dx+c)^{2}}}+\frac{\left(35\,a^{4}b^{2}+6\,a^{2}b^{4}+3\,b^{6}\right)\arctan\left(\frac{b\sqrt{\frac{e}{\tan(dx+c)}}}{\sqrt{abe}}\right)}{\left(a^{8}+3\,a^{6}b^{2}+3\,a^{4}b^{4}+a^{2}b^{6}\right)\sqrt{abe}\,e}+\frac{2\,\sqrt{2}\left(a^{3}-3\,a^{2}b-3\,ab^{2}+b^{3}\right)\arctan\cdots}{\cdots}\cdots\right)}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(1/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/4*e*(((13*a^3*b^2 + 5*a*b^4)*e*sqrt(e/tan(d*x + c)) + (11*a^2*b^3 + 3*b^
5)*(e/tan(d*x + c))^(3/2))/((a^8 + 2*a^6*b^2 + a^4*b^4)*e^3 + 2*(a^7*b + 2*
a^5*b^3 + a^3*b^5)*e^3/tan(d*x + c) + (a^6*b^2 + 2*a^4*b^4 + a^2*b^6)*e^3/t
an(d*x + c)^2) + (35*a^4*b^2 + 6*a^2*b^4 + 3*b^6)*arctan(b*sqrt(e/tan(d*x +
 c))/sqrt(a*b*e))/((a^8 + 3*a^6*b^2 + 3*a^4*b^4 + a^2*b^6)*sqrt(a*b*e)*e) +
 (2*sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*arctan(1/2*sqrt(2)*(sqrt(2)*sqr
```

```
t(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(2)*(a^3 - 3*a^2*b
- 3*a*b^2 + b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2*sqrt(e/tan(d*x +
c)))/sqrt(e))/sqrt(e) + sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*log(sqrt(2)
*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(e) - sqrt(2)*(a^3
+ 3*a^2*b - 3*a*b^2 - b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e +
e/tan(d*x + c))/sqrt(e))/((a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)*e))/d
```

mupad [B] time = 6.79, size = 20155, normalized size = 42.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(1/2)*(a + b*cot(c + d*x))^3),x)
```

```
[Out] atan(((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i
+ 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*
d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e
 + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d^2*e
- 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i
+ a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e
 - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i))
)^(1/2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*b^20*d^
4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^
14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*
a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^
24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^
5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5
+ 8*a^18*b^2*d^5) - ((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3
*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2
)*(e*cot(c + d*x))^(1/2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 +
17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^
10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*
d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^
5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*
d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^
4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)) + ((e*cot(c + d*x))^(1/2)*(72*a*b^22
*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^
2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*
d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2
*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^1
0*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b
^2*d^4)) - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^
9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9
 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(a
^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^
```

5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5))
+ ((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 +
892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8
))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^
10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d
^4))*1i - (1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*
20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(
b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d
^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d^
2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e
*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d
^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*
6i)))^(1/2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*b^2
0*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^1
2*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33
984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 12
8*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^1
2*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*
d^5 + 8*a^18*b^2*d^5) + ((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e -
a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^
(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^1
0 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^
4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b
^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^2
4*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b
^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^
6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)) - ((e*cot(c + d*x))^(1/2)*(72*a*
b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^1
6*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b
^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2
*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56
*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^
18*b^2*d^4)) - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^
2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2
*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9
)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^1
0*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^
5)) - ((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e
^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5
*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^1
0*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b
^2*d^4))*1i)/((9*b^14*e^8 + 60*a^2*b^12*e^8 + 318*a^4*b^10*e^8 + 748*a^6*b^
8*e^8 + 1505*a^8*b^6*e^8)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^
8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16
*b^4*d^5 + 8*a^18*b^2*d^5) + (1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2

*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i
)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e
*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*
(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*
d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d
^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*
e*6i + a^5*b*d^2*e*6i)))^(1/2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*
e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d
^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16
*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^2
2*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^
14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6
*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) - ((1i/(4*(b^6*d^2*e - a^6*d^2*e -
15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i +
a^5*b*d^2*e*6i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^4*b^25*d^4*e^10 + 46
08*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 +
46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*
e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*
d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(a^20*d^4 + a^4
*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b
^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)) + ((e*cot(c +
d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*
e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2
*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^
2*e^9 - 64*a^21*b^2*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 2
8*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*
a^16*b^4*d^4 + 8*a^18*b^2*d^4)) - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9
+ 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 -
34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 -
32*a^17*b^3*d^2*e^9)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^1
2*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*
d^5 + 8*a^18*b^2*d^5)) + ((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*
e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*
e^8 - 1257*a^12*b^5*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^
8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16
*b^4*d^4 + 8*a^18*b^2*d^4)) + (1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^
2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6
i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*
e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4
*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2
*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((1i/(4*(b^6*d^2*e - a^6*
d^2*e - 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2
*e*6i + a^5*b*d^2*e*6i)))^(1/2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4
*e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*
d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^1

6*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^
22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b
^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^
6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) + ((1i/(4*(b^6*d^2*e - a^6*d^2*e
- 15*a^2*b^4*d^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i
+ a^5*b*d^2*e*6i)))^(1/2)*(e*cot(c + d*x))^(1/2)*(512*a^4*b^25*d^4*e^10 + 4
608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10
+ 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4
*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7
*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(a^20*d^4 + a^
4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*
b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)) - ((e*cot(c
+ d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2
*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^
2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d
^2*e^9 - 64*a^21*b^2*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 +
28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28
*a^16*b^4*d^4 + 8*a^18*b^2*d^4)) - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^
9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9
- 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 -
 32*a^17*b^3*d^2*e^9)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^
12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4
*d^5 + 8*a^18*b^2*d^5)) - ((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17
*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7
*e^8 - 1257*a^12*b^5*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a
^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^1
6*b^4*d^4 + 8*a^18*b^2*d^4))))*(1i/(4*(b^6*d^2*e - a^6*d^2*e - 15*a^2*b^4*d
^2*e - a^3*b^3*d^2*e*20i + 15*a^4*b^2*d^2*e + a*b^5*d^2*e*6i + a^5*b*d^2*e*
6i)))^(1/2)*2i - ((b^3*(e*cot(c + d*x))^(3/2)*(11*a^2 + 3*b^2))/(4*a^2*(a^4
 + b^4 + 2*a^2*b^2)) + (b^2*e*(e*cot(c + d*x))^(1/2)*(13*a^2 + 5*b^2))/(4*a
*(a^2 + b^2)^2))/(a^2*d*e^2 + b^2*d*e^2*cot(c + d*x)^2 + 2*a*b*d*e^2*cot(c
+ d*x)) + atan((((((((1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i -
 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/
2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*b^20*d^4*e^1
0 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^14*d^
4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*a^18*
b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^24*b^
2*d^4*e^10)/(2*(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5
+ 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 +
8*a^18*b^2*d^5)) - ((e*cot(c + d*x))^(1/2)*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i
- a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e
+ 6*a^5*b*d^2*e))^(1/2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 1
7920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^1
0 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*d
^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^5

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*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(4*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^1
4*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*
d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4))))/2 + ((e*cot(c + d*x))^(1/2)*(72*
a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b
^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13
*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b
^2*d^2*e^9))/(2*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4
 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 +
 8*a^18*b^2*d^4)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20
*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2))
/2 - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 36
06*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9 - 149
70*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(2*(a^20
*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 +
 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5)))*(1
/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*
b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2))/2 + ((e*cot(c + d*x)
)^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8
+ 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8))/(2*(a^20*d^4 +
a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^1
2*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(1/(b^6*d
^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2
*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*1i - (((((((1/(b^6*d^2*e*1i
- a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i +
 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b
^22*d^4*e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^1
0*b^16*d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76
800*a^16*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 +
 384*a^22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(2*(a^20*d^5 + a^4*b^16*d^5
 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 +
56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5)) + ((e*cot(c + d*x))^(1
/2)*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e
+ a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*(512*a^4*b^25*d
^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^1
9*d^4*e^10 + 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^
16*b^13*d^4*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 179
20*a^22*b^7*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(4*
(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*
d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)
)))/2 - ((e*cot(c + d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 +
 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 +
53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9
+ 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2*e^9))/(2*(a^20*d^4 + a^4*b^16*d^
4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 +
 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(1/(b^6*d^2*e*1i - a
```

^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*
a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2))/2 - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*
d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^
2*e^9 - 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2
*e^9 - 32*a^17*b^3*d^2*e^9)/(2*(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 +
28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28
*a^16*b^4*d^5 + 8*a^18*b^2*d^5)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4
*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b
*d^2*e))^(1/2))/2 - ((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 -
71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 -
1257*a^12*b^5*e^8))/(2*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*
b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b
^4*d^4 + 8*a^18*b^2*d^4)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*
15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e)
)^(1/2)*1i)/((9*b^14*e^8 + 60*a^2*b^12*e^8 + 318*a^4*b^10*e^8 + 748*a^6*b^8
*e^8 + 1505*a^8*b^6*e^8)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8
*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*
b^4*d^5 + 8*a^18*b^2*d^5) + (((((((1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4
*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b
*d^2*e))^(1/2)*((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*
b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*
a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 +
33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 -
128*a^24*b^2*d^4*e^10)/(2*(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a
^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^1
6*b^4*d^5 + 8*a^18*b^2*d^5)) - ((e*cot(c + d*x))^(1/2)*(1/(b^6*d^2*e*1i - a
^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*
a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*
d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*
b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080
*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4
608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(4*(a^20*d^4 + a^4*b^16*d^4
+ 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 +
56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4))))/2 + ((e*cot(c + d*x)
)^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 +
14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9
+ 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9
- 64*a^21*b^2*d^2*e^9))/(2*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*
a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^
16*b^4*d^4 + 8*a^18*b^2*d^4)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^
2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^
2*e))^(1/2))/2 - (90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*
d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d
^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e
^9)/(2*(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^1

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0*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b
^2*d^5)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*
d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2))/2 + ((e*
cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 + 892*a
^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8))/(2*
(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*
d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)
))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e +
 a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2) + (((((((1/(b^6*
d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^
2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*((192*a^2*b^24*d^4*e^10 + 1
728*a^4*b^22*d^4*e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 +
62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*
e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d
^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(2*(a^20*d^5 + a^4
*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b
^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5)) + ((e*cot(c +
 d*x))^(1/2)*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b
^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*(512*a
^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400
*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 -
 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e
^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e
^10))/(4*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a
^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18
*b^2*d^4))))/2 - ((e*cot(c + d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*
d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d
^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8
*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2*e^9))/(2*(a^20*d^4 + a^
4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*
b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(1/(b^6*d^2
*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e
*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2))/2 - (90*a*b^19*d^2*e^9 + 846*
a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^
9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^1
5*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(2*(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^
14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6
*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i
- a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e
+ 6*a^5*b*d^2*e))^(1/2))/2 - ((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b
^17*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*
b^7*e^8 - 1257*a^12*b^5*e^8))/(2*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4
+ 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 +
28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b
^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5
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*b*d^2*e))^(1/2)))*(1/(b^6*d^2*e*1i - a^6*d^2*e*1i - a^2*b^4*d^2*e*15i - 20*a^3*b^3*d^2*e + a^4*b^2*d^2*e*15i + 6*a*b^5*d^2*e + 6*a^5*b*d^2*e))^(1/2)*1i + (atan((((((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) - (((90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) + (((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*1i)/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)) + ((((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) + (((90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^

8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) + ((((e*cot(c + d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) - (((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*1i)/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))/((9*b^14*e^8 + 60*a^2*b^12*e^8 + 318*a^4*b^10*e^8 + 748*a^6*b^8*e^8 + 1505*a^8*b^6*e^8)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) + ((((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) - (((90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) - ((((e*cot(c + d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) + (((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10

+ 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) - ((e*cot(c + d*x))^(1/2)*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512*a^26*b^3*d^4*e^10))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)) - ((((e*cot(c + d*x))^(1/2)*(18*a^2*b^15*e^8 - 9*b^17*e^8 - 71*a^4*b^13*e^8 + 892*a^6*b^11*e^8 + 857*a^8*b^9*e^8 + 6802*a^10*b^7*e^8 - 1257*a^12*b^5*e^8))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) + (((90*a*b^19*d^2*e^9 + 846*a^3*b^17*d^2*e^9 + 1714*a^5*b^15*d^2*e^9 + 3606*a^7*b^13*d^2*e^9 - 14578*a^9*b^11*d^2*e^9 - 34486*a^11*b^9*d^2*e^9 - 14970*a^13*b^7*d^2*e^9 + 2258*a^15*b^5*d^2*e^9 - 32*a^17*b^3*d^2*e^9)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) + ((((e*cot(c + d*x))^(1/2)*(72*a*b^22*d^2*e^9 + 576*a^3*b^20*d^2*e^9 + 5024*a^5*b^18*d^2*e^9 + 14272*a^7*b^16*d^2*e^9 + 27824*a^9*b^14*d^2*e^9 + 53184*a^11*b^12*d^2*e^9 + 70240*a^13*b^10*d^2*e^9 + 47680*a^15*b^8*d^2*e^9 + 12616*a^17*b^6*d^2*e^9 - 64*a^21*b^2*d^2*e^9))/(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^2*d^4) - (((192*a^2*b^24*d^4*e^10 + 1728*a^4*b^22*d^4*e^10 + 8320*a^6*b^20*d^4*e^10 + 27264*a^8*b^18*d^4*e^10 + 62592*a^10*b^16*d^4*e^10 + 99456*a^12*b^14*d^4*e^10 + 107520*a^14*b^12*d^4*e^10 + 76800*a^16*b^10*d^4*e^10 + 33984*a^18*b^8*d^4*e^10 + 7872*a^20*b^6*d^4*e^10 + 384*a^22*b^4*d^4*e^10 - 128*a^24*b^2*d^4*e^10)/(a^20*d^5 + a^4*b^16*d^5 + 8*a^6*b^14*d^5 + 28*a^8*b^12*d^5 + 56*a^10*b^10*d^5 + 70*a^12*b^8*d^5 + 56*a^14*b^6*d^5 + 28*a^16*b^4*d^5 + 8*a^18*b^2*d^5) + ((e*cot(c + d*x))^(1/2)*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*(512*a^4*b^25*d^4*e^10 + 4608*a^6*b^23*d^4*e^10 + 17920*a^8*b^21*d^4*e^10 + 38400*a^10*b^19*d^4*e^10 + 46080*a^12*b^17*d^4*e^10 + 21504*a^14*b^15*d^4*e^10 - 21504*a^16*b^13*d^4*e^10 - 46080*a^18*b^11*d^4*e^10 - 38400*a^20*b^9*d^4*e^10 - 17920*a^22*b^7*d^4*e^10 - 4608*a^24*b^5*d^4*e^10 - 512

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*a^26*b^3*d^4*e^10))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2
*d*e)*(a^20*d^4 + a^4*b^16*d^4 + 8*a^6*b^14*d^4 + 28*a^8*b^12*d^4 + 56*a^10
*b^10*d^4 + 70*a^12*b^8*d^4 + 56*a^14*b^6*d^4 + 28*a^16*b^4*d^4 + 8*a^18*b^
2*d^4)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^
5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3
*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d
*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b
^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^
4 + 6*a^2*b^2))/(8*(a^11*d*e + a^5*b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e)
)))*(-a^5*b^3*e)^(1/2)*(35*a^4 + 3*b^4 + 6*a^2*b^2)*1i)/(4*(a^11*d*e + a^5*
b^6*d*e + 3*a^7*b^4*d*e + 3*a^9*b^2*d*e))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(1/2)/(a+b*cot(d*x+c))**3,x)
```

```
[Out] Integral(1/(sqrt(e*cot(c + d*x))*(a + b*cot(c + d*x))**3), x)
```

3.87 $\int \frac{1}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=529

$$\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)^3}-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+\right.}{2\sqrt{2}de^{3/2}\left(a^2\right.}$$

```
[Out] 1/4*b^(5/2)*(63*a^4+46*a^2*b^2+15*b^4)*arctan(b^(1/2)*(e*cot(d*x+c))^(1/2)/
a^(1/2)/e^(1/2))/a^(7/2)/(a^2+b^2)^3/d/e^(3/2)-1/2*(a-b)*(a^2+4*a*b+b^2)*ar
ctan(1-2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a^2+b^2)^3/d/e^(3/2)*2^(1/2)+
1/2*(a-b)*(a^2+4*a*b+b^2)*arctan(1+2^(1/2)*(e*cot(d*x+c))^(1/2)/e^(1/2))/(a
^2+b^2)^3/d/e^(3/2)*2^(1/2)+1/4*(a+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)
*e^(1/2)-2^(1/2)*(e*cot(d*x+c))^(1/2))/(a^2+b^2)^3/d/e^(3/2)*2^(1/2)-1/4*(a
+b)*(a^2-4*a*b+b^2)*ln(e^(1/2)+cot(d*x+c)*e^(1/2)+2^(1/2)*(e*cot(d*x+c))^(1
/2))/(a^2+b^2)^3/d/e^(3/2)*2^(1/2)+1/4*(8*a^4+31*a^2*b^2+15*b^4)/a^3/(a^2+b
^2)^2/d/e/(e*cot(d*x+c))^(1/2)-1/2*b^2/a/(a^2+b^2)/d/e/(a+b*cot(d*x+c))^2/(
e*cot(d*x+c))^(1/2)-1/4*b^2*(13*a^2+5*b^2)/a^2/(a^2+b^2)^2/d/e/(a+b*cot(d*x
+c))/(e*cot(d*x+c))^(1/2)
```

Rubi [A] time = 1.66, antiderivative size = 529, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3569, 3649, 3653, 3534, 1168, 1162, 617, 204, 1165, 628, 3634, 63, 205}

$$\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+dx)-\sqrt{2}\sqrt{e\cot(c+dx)}+\sqrt{e}\right)}{2\sqrt{2}de^{3/2}\left(a^2+b^2\right)^3}-\frac{(a+b)\left(a^2-4ab+b^2\right)\log\left(\sqrt{e}\cot(c+\right.}{2\sqrt{2}de^{3/2}\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^3),x]
```

```
[Out] (b^(5/2)*(63*a^4 + 46*a^2*b^2 + 15*b^4)*ArcTan[(Sqrt[b]*Sqrt[e*Cot[c + d*x]
])/(Sqrt[a]*Sqrt[e])]])/(4*a^(7/2)*(a^2 + b^2)^3*d*e^(3/2)) - ((a - b)*(a^2
 + 4*a*b + b^2)*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]
*(a^2 + b^2)^3*d*e^(3/2)) + ((a - b)*(a^2 + 4*a*b + b^2)*ArcTan[1 + (Sqrt[2
]*Sqrt[e*Cot[c + d*x]])/Sqrt[e]])/(Sqrt[2]*(a^2 + b^2)^3*d*e^(3/2)) + (8*a^
4 + 31*a^2*b^2 + 15*b^4)/(4*a^3*(a^2 + b^2)^2*d*e*Sqrt[e*Cot[c + d*x]]) - b
^2/(2*a*(a^2 + b^2)*d*e*Sqrt[e*Cot[c + d*x]]*(a + b*Cot[c + d*x])^2) - (b^2
*(13*a^2 + 5*b^2))/(4*a^2*(a^2 + b^2)^2*d*e*Sqrt[e*Cot[c + d*x]]*(a + b*Cot
[c + d*x])) + ((a + b)*(a^2 - 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*
x] - Sqrt[2]*Sqrt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d*e^(3/2)) - (
```

```
(a + b)*(a^2 - 4*a*b + b^2)*Log[Sqrt[e] + Sqrt[e]*Cot[c + d*x] + Sqrt[2]*Sq
rt[e*Cot[c + d*x]]])/(2*Sqrt[2]*(a^2 + b^2)^3*d*e^(3/2))
```

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 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 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 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 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 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 1168

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
a*c, 2]}, Dist[(d*q + a*e)/(2*a*c), Int[(q + c*x^2)/(a + c*x^4), x], x] + D
ist[(d*q - a*e)/(2*a*c), Int[(q - c*x^2)/(a + c*x^4), x], x]] /; FreeQ[{a,
c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && NeQ[c*d^2 - a*e^2, 0] && NegQ[-(a*
c)]
```

Rule 3534

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/Sqrt[(b_.)*tan[(e_.) + (f_.)*(x_
)]], x_Symbol] :> Dist[2/f, Subst[Int[(b*c + d*x^2)/(b^2 + x^4), x], x, Sqr
t[b*Tan[e + f*x]]], x] /; FreeQ[{b, c, d, e, f}, x] && NeQ[c^2 - d^2, 0] &&
 NeQ[c^2 + d^2, 0]
```

Rule 3569

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_), x_Symbol] :> Simp[(b^2*(a + b*Tan[e + f*x])^(m + 1)*(c
+ d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(a^2 + b^2)*(b*c - a*d)), x] + Dist[1
/((m + 1)*(a^2 + b^2)*(b*c - a*d)), Int[(a + b*Tan[e + f*x])^(m + 1)*(c + d
*Tan[e + f*x])^n*Simp[a*(b*c - a*d)*(m + 1) - b^2*d*(m + n + 2) - b*(b*c -
a*d)*(m + 1)*Tan[e + f*x] - b^2*d*(m + n + 2)*Tan[e + f*x]^2, x], x], x] /;
 FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0]
&& NeQ[c^2 + d^2, 0] && IntegerQ[2*m] && LtQ[m, -1] && (LtQ[n, 0] || Intege
rQ[m]) &&  !(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3634

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_.) + (d_.)*tan[(e_.)
+ (f_.)*(x_)])^(n_.)*((A_) + (C_.)*tan[(e_.) + (f_.)*(x_)]^2), x_Symbol] :>
 Dist[A/f, Subst[Int[(a + b*x)^m*(c + d*x)^n, x], x, Tan[e + f*x]], x] /; F
reeQ[{a, b, c, d, e, f, A, C, m, n}, x] && EqQ[A, C]
```

Rule 3649

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.) + (f_.)*(x_)] + (C_.)*tan[(e_.)
 + (f_.)*(x_)]^2), x_Symbol] :> Simp[((A*b^2 - a*(b*B - a*C))*(a + b*Tan[e
+ f*x])^(m + 1)*(c + d*Tan[e + f*x])^(n + 1))/(f*(m + 1)*(b*c - a*d)*(a^2 +
 b^2)), x] + Dist[1/((m + 1)*(b*c - a*d)*(a^2 + b^2)), Int[(a + b*Tan[e + f
*x])^(m + 1)*(c + d*Tan[e + f*x])^n*Simp[A*(a*(b*c - a*d)*(m + 1) - b^2*d*(
```

```
m + n + 2)) + (b*B - a*C)*(b*c*(m + 1) + a*d*(n + 1)) - (m + 1)*(b*c - a*d)
*(A*b - a*B - b*C)*Tan[e + f*x] - d*(A*b^2 - a*(b*B - a*C))*(m + n + 2)*Tan
[e + f*x]^2, x], x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C, n}, x] && NeQ[
b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] && LtQ[m, -1] &&  !
(ILtQ[n, -1] && ( !IntegerQ[m] || (EqQ[c, 0] && NeQ[a, 0])))
```

Rule 3653

```
Int[(((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_)*((A_.) + (B_.)*tan[(e_.)
+ (f_.)*(x_)] + (C_.)*tan[(e_.) + (f_.)*(x_)]^2))/((a_.) + (b_.)*tan[(e_.)
+ (f_.)*(x_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(c + d*Tan[e + f*x])^n
*Simp[b*B + a*(A - C) + (a*B - b*(A - C))*Tan[e + f*x], x], x], x] + Dist[(
A*b^2 - a*b*B + a^2*C)/(a^2 + b^2), Int[((c + d*Tan[e + f*x])^n*(1 + Tan[e
+ f*x]^2))/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, A, B, C
, n}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&
 !GtQ[n, 0] &&  !LeQ[n, -1]
```

Rubi steps

$$\int \frac{1}{(e\cot(c+dx))^{3/2}(a+b\cot(c+dx))^3}\,dx = -\frac{b^2}{2a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2} - \frac{\int \frac{-\frac{1}{2}\left(4a^2+5b^2\right)e\cdots}{(e\cot(\cdots}}{\cdots}$$

$$= -\frac{b^2}{2a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a+b\cot(c+dx))^2} - \frac{\cdots}{4a^2\left(a^2+b^2\right)^2\cdots}$$

$$= \frac{8a^4+31a^2b^2+15b^4}{4a^3\left(a^2+b^2\right)^2 de\sqrt{e\cot(c+dx)}} - \frac{b^2}{2a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a\cdots}$$

$$= \frac{8a^4+31a^2b^2+15b^4}{4a^3\left(a^2+b^2\right)^2 de\sqrt{e\cot(c+dx)}} - \frac{b^2}{2a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a\cdots}$$

$$= \frac{8a^4+31a^2b^2+15b^4}{4a^3\left(a^2+b^2\right)^2 de\sqrt{e\cot(c+dx)}} - \frac{b^2}{2a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a\cdots}$$

$$= \frac{8a^4+31a^2b^2+15b^4}{4a^3\left(a^2+b^2\right)^2 de\sqrt{e\cot(c+dx)}} - \frac{b^2}{2a\left(a^2+b^2\right)de\sqrt{e\cot(c+dx)}\,(a\cdots}$$

$$= \frac{b^{5/2}\left(63a^4+46a^2b^2+15b^4\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4a^{7/2}\left(a^2+b^2\right)^3 de^{3/2}} + \frac{8a^4+31\cdots}{4a^3\left(a^2+b^2\right)^2\cdots}$$

$$= \frac{b^{5/2}\left(63a^4+46a^2b^2+15b^4\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4a^{7/2}\left(a^2+b^2\right)^3 de^{3/2}} + \frac{8a^4+31\cdots}{4a^3\left(a^2+b^2\right)^2\cdots}$$

$$= \frac{b^{5/2}\left(63a^4+46a^2b^2+15b^4\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt{e\cot(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{4a^{7/2}\left(a^2+b^2\right)^3 de^{3/2}} - \frac{(a-b)\left(a^2+4\cdots\right.}{\cdots}$$

Mathematica [C] time = 1.79, size = 303, normalized size = 0.57

$$-\frac{-8a^2b^2\left(3a^2-b^2\right)\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-\frac{b\cot(c+dx)}{a}\right)-16a^2b^2\left(a^2+b^2\right)\,{}_2F_1\left(-\frac{1}{2},2;\frac{1}{2};-\frac{b\cot(c+dx)}{a}\right)-8b^2\left(a^2+b^2\right)^2\,{}_2F_1\left(\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cot[c + d*x])^(3/2)*(a + b*Cot[c + d*x])^3),x]
```

```
[Out] -1/4*(-8*a^2*b^2*(3*a^2 - b^2)*Hypergeometric2F1[-1/2, 1, 1/2, -((b*Cot[c +
 d*x])/a)] - 16*a^2*b^2*(a^2 + b^2)*Hypergeometric2F1[-1/2, 2, 1/2, -((b*Co
t[c + d*x])/a)] - 8*b^2*(a^2 + b^2)^2*Hypergeometric2F1[-1/2, 3, 1/2, -((b*
Cot[c + d*x])/a)] - 8*a^4*(a^2 - 3*b^2)*Hypergeometric2F1[-1/4, 1, 3/4, -Co
t[c + d*x]^2] + Sqrt[2]*a^3*b*(3*a^2 - b^2)*Sqrt[Cot[c + d*x]]*(2*ArcTan[1
- Sqrt[2]*Sqrt[Cot[c + d*x]]] - 2*ArcTan[1 + Sqrt[2]*Sqrt[Cot[c + d*x]]] +
Log[1 - Sqrt[2]*Sqrt[Cot[c + d*x]] + Cot[c + d*x]] - Log[1 + Sqrt[2]*Sqrt[C
ot[c + d*x]] + Cot[c + d*x]]))/(a^3*(a^2 + b^2)^3*d*e*Sqrt[e*Cot[c + d*x]])
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(b\cot(dx+c)+a)^3\,(e\cot(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((b*cot(d*x + c) + a)^3*(e*cot(d*x + c))^(3/2)), x)
```

maple [B] time = 0.80, size = 1245, normalized size = 2.35

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x)
```

```
[Out] 15/4/d/e*b^4*a/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)+11/2
/d/e*b^6/a/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)+7/4/d/e*
b^8/a^3/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(3/2)+17/4/d*b^3*
a^2/(a^2+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)+13/2/d*b^5/(a^2
+b^2)^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)+9/4/d*b^7/a^2/(a^2+b^2)
^3/(e*cot(d*x+c)*b+a*e)^2*(e*cot(d*x+c))^(1/2)+63/4/d/e*b^3*a/(a^2+b^2)^3/(
a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+23/2/d/e*b^5/a/(a
```

```
^2+b^2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^(1/2))+15/4/d
/e*b^7/a^3/(a^2+b^2)^3/(a*e*b)^(1/2)*arctan((e*cot(d*x+c))^(1/2)*b/(a*e*b)^
(1/2))-3/2/d/e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(-2^(1/2)/(e^2)^(1/4
)*(e*cot(d*x+c))^(1/2)+1)*a^2*b+1/2/d/e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*a
rctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*b^3+3/4/d/e^2/(a^2+b^2)^
3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(
1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e
^2)^(1/2)))*a^2*b-1/4/d/e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*ln((e*cot(d*x+c
)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)-(e^2)
^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*b^3+3/2/d/e^2/(a^2+b^2)^3
*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^2
*b-1/2/d/e^2/(a^2+b^2)^3*(e^2)^(1/4)*2^(1/2)*arctan(2^(1/2)/(e^2)^(1/4)*(e*
cot(d*x+c))^(1/2)+1)*b^3+1/4/d/e/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(
d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+
(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+(e^2)^(1/2)))*a^3-3/4/d/e/(a^2+b^2
)^3*2^(1/2)/(e^2)^(1/4)*ln((e*cot(d*x+c)-(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2
^(1/2)+(e^2)^(1/2))/(e*cot(d*x+c)+(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)*2^(1/2)+
(e^2)^(1/2)))*a*b^2-1/2/d/e/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(-2^(1/2)
/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a^3+3/2/d/e/(a^2+b^2)^3*2^(1/2)/(e^2)^
(1/4)*arctan(-2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2)+1)*a*b^2+1/2/d/e/(a^
2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)*(e*cot(d*x+c))^(1/2
)+1)*a^3-3/2/d/e/(a^2+b^2)^3*2^(1/2)/(e^2)^(1/4)*arctan(2^(1/2)/(e^2)^(1/4)
*(e*cot(d*x+c))^(1/2)+1)*a*b^2+2/a^3/d/e/(e*cot(d*x+c))^(1/2)
```

maxima [A] time = 0.45, size = 565, normalized size = 1.07

$$e\left(\frac{8\left(a^{6}+2\,a^{4}b^{2}+a^{2}b^{4}\right)e^{2}+\frac{\left(16\,a^{5}b+49\,a^{3}b^{3}+25\,ab^{5}\right)e^{2}}{\tan(dx+c)}+\frac{\left(8\,a^{4}b^{2}+31\,a^{2}b^{4}+15\,b^{6}\right)e^{2}}{\tan(dx+c)^{2}}}{\left(a^{9}+2\,a^{7}b^{2}+a^{5}b^{4}\right)e^{4}\sqrt{\frac{e}{\tan(dx+c)}}+2\left(a^{8}b+2\,a^{6}b^{3}+a^{4}b^{5}\right)e^{3}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{3}{2}}+\left(a^{7}b^{2}+2\,a^{5}b^{4}+a^{3}b^{6}\right)e^{2}\left(\frac{e}{\tan(dx+c)}\right)^{\frac{5}{2}}}+\frac{\left(63\,a^{4}b^{3}+46\,a^{2}b^{5}+15\,b^{7}\right)\arctan\left(\frac{b\sqrt{\cdots}}{\cdots}\right.}{\left(a^{9}+3\,a^{7}b^{2}+3\,a^{5}b^{4}+a^{3}b^{6}\right)\sqrt{ab\cdots}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))^(3/2)/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/4*e*((8*(a^6 + 2*a^4*b^2 + a^2*b^4)*e^2 + (16*a^5*b + 49*a^3*b^3 + 25*a*b
^5)*e^2/tan(d*x + c) + (8*a^4*b^2 + 31*a^2*b^4 + 15*b^6)*e^2/tan(d*x + c)^2
)/((a^9 + 2*a^7*b^2 + a^5*b^4)*e^4*sqrt(e/tan(d*x + c)) + 2*(a^8*b + 2*a^6*
b^3 + a^4*b^5)*e^3*(e/tan(d*x + c))^(3/2) + (a^7*b^2 + 2*a^5*b^4 + a^3*b^6)
*e^2*(e/tan(d*x + c))^(5/2)) + (63*a^4*b^3 + 46*a^2*b^5 + 15*b^7)*arctan(b*
sqrt(e/tan(d*x + c))/sqrt(a*b*e))/((a^9 + 3*a^7*b^2 + 3*a^5*b^4 + a^3*b^6)*
sqrt(a*b*e)*e^2) + (2*sqrt(2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(1/2*sq
```

```
rt(2)*(sqrt(2)*sqrt(e) + 2*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) + 2*sqrt(
2)*(a^3 + 3*a^2*b - 3*a*b^2 - b^3)*arctan(-1/2*sqrt(2)*(sqrt(2)*sqrt(e) - 2
*sqrt(e/tan(d*x + c)))/sqrt(e))/sqrt(e) - sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2
+ b^3)*log(sqrt(2)*sqrt(e)*sqrt(e/tan(d*x + c)) + e + e/tan(d*x + c))/sqrt(
e) + sqrt(2)*(a^3 - 3*a^2*b - 3*a*b^2 + b^3)*log(-sqrt(2)*sqrt(e)*sqrt(e/ta
n(d*x + c)) + e + e/tan(d*x + c))/sqrt(e))/((a^6 + 3*a^4*b^2 + 3*a^2*b^4 +
b^6)*e^2))/d
```

mupad [B] time = 10.00, size = 21158, normalized size = 40.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cot(c + d*x))^(3/2)*(a + b*cot(c + d*x))^3),x)
```

```
[Out] ((2*e)/a + (e*cot(c + d*x)*(16*a^4*b + 25*b^5 + 49*a^2*b^3))/(4*a^2*(a^4 +
b^4 + 2*a^2*b^2)) + (b^2*e^2*cot(c + d*x)^2*(8*a^4 + 15*b^4 + 31*a^2*b^2))/
(4*a^3*(a^4*e + b^4*e + 2*a^2*b^2*e)))/(b^2*d*(e*cot(c + d*x))^(5/2) + a^2*
d*e^2*(e*cot(c + d*x))^(1/2) + 2*a*b*d*e*(e*cot(c + d*x))^(3/2)) + atan((((
-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 1
5*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(((e*
cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^
7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 +
 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 2076
9933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 6953494
5902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 9950871735
5008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 5976709555814
4*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a
^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^
12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16
 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64
*b^2*d^7*e^16) + (-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^
5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*
e^3)))^(1/2)*(251658240*a^24*b^45*d^8*e^18 - (e*cot(c + d*x))^(1/2)*(-1i/(4
*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*
b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(134217728*
a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*
d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^1
9 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5
202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 563580
2398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 22543209594
88*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^
53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^
15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9
*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 25
```

50136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19) + 5049942016*a^26*b^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2) - 117964800*a^21*b^42*d^6*e^15 - 841482240*a^23*b^40*d^6*e^15 + 3829399552*a^25*b^38*d^6*e^15 + 78068580352*a^27*b^36*d^6*e^15 + 497438162944*a^29*b^34*d^6*e^15 + 1899895980032*a^31*b^32*d^6*e^15 + 4972695519232*a^33*b^30*d^6*e^15 + 9371195015168*a^35*b^28*d^6*e^15 + 12890720436224*a^37*b^26*d^6*e^15 + 12726089809920*a^39*b^24*d^6*e^15 + 8366961197056*a^41*b^22*d^6*e^15 + 2597662490624*a^43*b^20*d^6*e^15 - 1171836108800*a^45*b^18*d^6*e^15 - 1986881650688*a^47*b^16*d^6*e^15 - 1237583921152*a^49*b^14*d^6*e^15 - 449507753984*a^51*b^12*d^6*e^15 - 97476149248*a^53*b^10*d^6*e^15 - 11931222016*a^55*b^8*d^6*e^15 - 1006632960*a^57*b^6*d^6*e^15 - 134217728*a^59*b^4*d^6*e^15 - 8388608*a^61*b^2*d^6*e^15) - (e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*1i + ((-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7*e^16) - (-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*

b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^
3)))^(1/2)*((e*cot(c + d*x))^(1/2)*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b
^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i
 + 15*a^4*b^2*d^2*e^3)))^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a
^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39
*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e
^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 +
 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254
320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 563580239
8720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*
a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*
b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9
*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 1342
17728*a^69*b^3*d^9*e^19) + 251658240*a^24*b^45*d^8*e^18 + 5049942016*a^26*b
^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*
e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18
 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 3
5469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 5298
3958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 3509028
5461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916
608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^
56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^
8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167
772160*a^66*b^3*d^8*e^18))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e
^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^
4*b^2*d^2*e^3)))^(1/2) + 117964800*a^21*b^42*d^6*e^15 + 841482240*a^23*b^40
*d^6*e^15 - 3829399552*a^25*b^38*d^6*e^15 - 78068580352*a^27*b^36*d^6*e^15
 - 497438162944*a^29*b^34*d^6*e^15 - 1899895980032*a^31*b^32*d^6*e^15 - 4972
695519232*a^33*b^30*d^6*e^15 - 9371195015168*a^35*b^28*d^6*e^15 - 128907204
36224*a^37*b^26*d^6*e^15 - 12726089809920*a^39*b^24*d^6*e^15 - 836696119705
6*a^41*b^22*d^6*e^15 - 2597662490624*a^43*b^20*d^6*e^15 + 1171836108800*a^4
5*b^18*d^6*e^15 + 1986881650688*a^47*b^16*d^6*e^15 + 1237583921152*a^49*b^1
4*d^6*e^15 + 449507753984*a^51*b^12*d^6*e^15 + 97476149248*a^53*b^10*d^6*e^
15 + 11931222016*a^55*b^8*d^6*e^15 + 1006632960*a^57*b^6*d^6*e^15 + 1342177
28*a^59*b^4*d^6*e^15 + 8388608*a^61*b^2*d^6*e^15) - (e*cot(c + d*x))^(1/2)*
(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*
a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^
5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13
 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 37
17287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474
491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*
a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d
^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13))*(-1i/(4
*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*
b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*1i)/(((-1i/

(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7*e^16) - (-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*((e*cot(c + d*x))^(1/2)*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19) + 251658240*a^24*b^45*d^8*e^18 + 5049942016*a^26*b^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2) + 117964800*a^21*b^42*d^6*e^15 + 841482240*a^23*b^40*d^6*e^15 - 3829399552*a^25*b^38*d^6*e^15 - 78068580352*a^27*b^36*d^6*e^15 - 497438162944*a^29*b^34*d^6*e^15 - 1899895980032*a^31*b^32*d^6*e^15 - 4972695519232*a^33*b^30*d^6*e^15 - 9371195015168*a^35*b^28*d^6*e^15 - 12890720436224*a^37*b^26*d^6*e^15 - 12726089809920*a^39*b^24*d^6*e^15 - 8366961197056*a^41*b^22*d^6*e^15 - 2597662490624*a^43*b^20*d^6*e^15 + 1171836108800*a^45*b^18*d^6*e^15 + 1986881650688*a^47*b^16*d^6*e^15 + 1237583921152*a^49*b^14* d^6*e^15 + 449507753984*a^51*b^12*d^6*e^15 + 97476149248*a^53*b^10*d^6*e^15 + 11931222016*a^55*b^8*d^6*e^15 + 1006632960*a^57*b^6*d^6*e^15 + 134217728 *a^59*b^4*d^6*e^15 + 8388608*a^61*b^2*d^6*e^15) - (e*cot(c + d*x))^(1/2)*(7 610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^ 25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5* e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717 287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 180747449 1392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^ 47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5 *e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^ 4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2) - ((-1i/(4*(b ^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4 *d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(((e*cot(c + d *x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 24646485 27872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 2076993336115 2*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a ^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42 *b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^ 20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16* d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^ 16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 167772 16*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7* e^16) + (-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e ^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1 /2)*(251658240*a^24*b^45*d^8*e^18 - (e*cot(c + d*x))^(1/2)*(-1i/(4*(b^6*d^2 *e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e ^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*(134217728*a^27*b^45 *d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 14306 26762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137 280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a ^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b ^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d ^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^ 19 - 1430626762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 1 27506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832* a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19) + 5049942016*a^26*b^43*d^8 *e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531 192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618 315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077 440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504 *a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2) - 117964800*a^21*b^42*d^6*e^15 - 841482240*a^23*b^40*d^6*e^15 + 3829399552*a^25*b^38*d^6*e^15 + 78068580352*a^27*b^36*d^6*e^15 + 497438162944*a^29*b^34*d^6*e^15 + 1899895980032*a^31*b^32*d^6*e^15 + 4972695519232*a^33*b^30*d^6*e^15 + 9371195015168*a^35*b^28*d^6*e^15 + 12890720436224*a^37*b^26*d^6*e^15 + 12726089809920*a^39*b^24*d^6*e^15 + 8366961197056*a^41*b^22*d^6*e^15 + 2597662490624*a^43*b^20*d^6*e^15 - 1171836108800*a^45*b^18*d^6*e^15 - 1986881650688*a^47*b^16*d^6*e^15 - 1237583921152*a^49*b^14*d^6*e^15 - 449507753984*a^51*b^12*d^6*e^15 - 97476149248*a^53*b^10*d^6*e^15 - 11931222016*a^55*b^8*d^6*e^15 - 1006632960*a^57*b^6*d^6*e^15 - 134217728*a^59*b^4*d^6*e^15 - 8388608*a^61*b^2*d^6*e^15) - (e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2) + 58982400*a^22*b^35*d^4*e^12 + 920125440*a^24*b^33*d^4*e^12 + 6879444992*a^26*b^31*d^4*e^12 + 32454475776*a^28*b^29*d^4*e^12 + 107338792960*a^30*b^27*d^4*e^12 + 262062735360*a^32*b^25*d^4*e^12 + 485059461120*a^34*b^23*d^4*e^12 + 688908140544*a^36*b^21*d^4*e^12 + 751987064832*a^38*b^19*d^4*e^12 + 626086379520*a^40*b^17*d^4*e^12 + 390506741760*a^42*b^15*d^4*e^12 + 176637870080*a^44*b^13*d^4*e^12 + 54704996352*a^46*b^11*d^4*e^12 + 10374086656*a^48*b^9*d^4*e^12 + 908328960*a^50*b^7*d^4*e^12))*(-1i/(4*(b^6*d^2*e^3 - a^6*d^2*e^3 + a*b^5*d^2*e^3*6i + a^5*b*d^2*e^3*6i - 15*a^2*b^4*d^2*e^3 - a^3*b^3*d^2*e^3*20i + 15*a^4*b^2*d^2*e^3)))^(1/2)*2i + (log(((((-1/(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i))^(1/2)*((((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d

^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7*e^16) + ((-1/(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i))^(1/2)*(251658240*a^24*b^45*d^8*e^18 - ((e*cot(c + d*x))^(1/2)*(-1/(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i))^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19))/2 + 5049942016*a^26*b^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18))/2)*(-1/(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i))^(1/2))/2 - 117964800*a^21*b^42*d^6*e^15 - 841482240*a^23*b^40*d^6*e^15 + 3829399552*a^25*b^38*d^6*e^15 + 78068580352*a^27*b^36*d^6*e^15 + 497438162944*a^29*b^34*d^6*e^15 + 1899895980032*a^31*b^32*d^6*e^15 + 4972695519232*a^33*b^30*d^6*e^15 + 9371195015168*a^35*b^28*d^6*e^15 + 12890720436224*a^37*b^26*d^6*e^15 + 12726089809920*a^39*b^24*d^6*e^15 + 8366961197056*a^41*b^22*d^6*e^15 + 2597662490624*a^43*b^20*d^6*e^15 - 1171836108800*a^45*b^18*d^6*e^15 - 1986881650688*a^47*b^16*d^6*e^15 - 1237583921152*a^49*b^14*d^6*e^15 - 449507753984*a^51*b^12*d^6*e^15 - 97476149248*a^53*b^10*d^6*e^15 - 11931222016*a^55*b^8*d^6*e^15 - 1006632960*a^57*b^6*d^6*e^15 - 134217728*a^59*b^4*d^6*e^15 - 8388608*a^61*b^2*d^6*e^15))/2 - (e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a

^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13))*(-1/(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i))^(1/2))/2 - 29491200*a^22*b^35*d^4*e^12 - 460062720*a^24*b^33*d^4*e^12 - 3439722496*a^26*b^31*d^4*e^12 - 16227237888*a^28*b^29*d^4*e^12 - 53669396480*a^30*b^27*d^4*e^12 - 131031367680*a^32*b^25*d^4*e^12 - 242529730560*a^34*b^23*d^4*e^12 - 344454070272*a^36*b^21*d^4*e^12 - 375993532416*a^38*b^19*d^4*e^12 - 313043189760*a^40*b^17*d^4*e^12 - 195253370880*a^42*b^15*d^4*e^12 - 88318935040*a^44*b^13*d^4*e^12 - 27352498176*a^46*b^11*d^4*e^12 - 5187043328*a^48*b^9*d^4*e^12 - 454164480*a^50*b^7*d^4*e^12)*(-1/(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i))^(1/2))/2 - log(- ((-1/(4*(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i)))^(1/2)*(((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7*e^16) - (-1/(4*(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i)))^(1/2)*((e*cot(c + d*x))^(1/2)*(-1/(4*(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i)))^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19) + 251658240*a^24*b^45*d^8*e^18 + 5049942016*a^26*b^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a

^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18))*(-1/(4*(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i)))^(1/2) + 117964800*a^21*b^42*d^6*e^15 + 841482240*a^23*b^40*d^6*e^15 - 3829399552*a^25*b^38*d^6*e^15 - 78068580352*a^27*b^36*d^6*e^15 - 497438162944*a^29*b^34*d^6*e^15 - 1899895980032*a^31*b^32*d^6*e^15 - 4972695519232*a^33*b^30*d^6*e^15 - 9371195015168*a^35*b^28*d^6*e^15 - 12890720436224*a^37*b^26*d^6*e^15 - 12726089809920*a^39*b^24*d^6*e^15 - 8366961197056*a^41*b^22*d^6*e^15 - 2597662490624*a^43*b^20*d^6*e^15 + 1171836108800*a^45*b^18*d^6*e^15 + 1986881650688*a^47*b^16*d^6*e^15 + 1237583921152*a^49*b^14*d^6*e^15 + 449507753984*a^51*b^12*d^6*e^15 + 97476149248*a^53*b^10*d^6*e^15 + 11931222016*a^55*b^8*d^6*e^15 + 1006632960*a^57*b^6*d^6*e^15 + 134217728*a^59*b^4*d^6*e^15 + 8388608*a^61*b^2*d^6*e^15) - (e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13))*(-1/(4*(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i)))^(1/2) - 29491200*a^22*b^35*d^4*e^12 - 460062720*a^24*b^33*d^4*e^12 - 3439722496*a^26*b^31*d^4*e^12 - 16227237888*a^28*b^29*d^4*e^12 - 53669396480*a^30*b^27*d^4*e^12 - 131031367680*a^32*b^25*d^4*e^12 - 242529730560*a^34*b^23*d^4*e^12 - 344454070272*a^36*b^21*d^4*e^12 - 375993532416*a^38*b^19*d^4*e^12 - 313043189760*a^40*b^17*d^4*e^12 - 195253370880*a^42*b^15*d^4*e^12 - 88318935040*a^44*b^13*d^4*e^12 - 27352498176*a^46*b^11*d^4*e^12 - 5187043328*a^48*b^9*d^4*e^12 - 454164480*a^50*b^7*d^4*e^12)*(-1/(4*(b^6*d^2*e^3*1i - a^6*d^2*e^3*1i + 6*a*b^5*d^2*e^3 + 6*a^5*b*d^2*e^3 - a^2*b^4*d^2*e^3*15i - 20*a^3*b^3*d^2*e^3 + a^4*b^2*d^2*e^3*15i)))^(1/2) - (atan(((((e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13) - ((63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e

^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16
 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 +
99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 597
67095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 134118
15522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 8054259056
64*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^
8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 167
77216*a^64*b^2*d^7*e^16) + ((63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(
1/2)*(251658240*a^24*b^45*d^8*e^18 + 5049942016*a^26*b^43*d^8*e^18 + 483687
13728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*
a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*a^36
*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^40*b^
29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b^25*
d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21*d^8
*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^1
8 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18
572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*
a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e
^18 - ((e*cot(c + d*x))^(1/2)*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)
^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 2281
7013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240
*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39
*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29
*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*
e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19
 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 312
1367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 49727668
2240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65
*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19)
)/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3))))/(
8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*a
^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2))/(8*(a^13*d*e^3 + a^7*b^6*d*
e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)) - 117964800*a^21*b^42*d^6*e^15 -
 841482240*a^23*b^40*d^6*e^15 + 3829399552*a^25*b^38*d^6*e^15 + 78068580352
*a^27*b^36*d^6*e^15 + 497438162944*a^29*b^34*d^6*e^15 + 1899895980032*a^31*
b^32*d^6*e^15 + 4972695519232*a^33*b^30*d^6*e^15 + 9371195015168*a^35*b^28*
d^6*e^15 + 12890720436224*a^37*b^26*d^6*e^15 + 12726089809920*a^39*b^24*d^6
*e^15 + 8366961197056*a^41*b^22*d^6*e^15 + 2597662490624*a^43*b^20*d^6*e^15
 - 1171836108800*a^45*b^18*d^6*e^15 - 1986881650688*a^47*b^16*d^6*e^15 - 12
37583921152*a^49*b^14*d^6*e^15 - 449507753984*a^51*b^12*d^6*e^15 - 97476149
248*a^53*b^10*d^6*e^15 - 11931222016*a^55*b^8*d^6*e^15 - 1006632960*a^57*b^
6*d^6*e^15 - 134217728*a^59*b^4*d^6*e^15 - 8388608*a^61*b^2*d^6*e^15))/(8*(
a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*a^4
+ 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*1i)/(8*(a^13*d*e^3 + a^7*b^6*d*
e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)) + (((e*cot(c + d*x))^(1/2)*(7610

564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*
b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^1
3 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 22
40523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287
903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 180747449139
2*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*
b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^
13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13) - ((63*a^4 +
15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(471859
200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b
^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^
7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^
16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16
+ 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 8
6342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 3243
2589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16*d^7*e^16 + 4030457
708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^16 + 86608183296*a
^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^
16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7*e^16) - ((63*a^4 +
15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*(251658240*a^24*b^45*d^8*e^18 +
5049942016*a^26*b^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 2938193838
08*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^
34*b^35*d^8*e^18 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*
b^31*d^8*e^18 + 35469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^2
7*d^8*e^18 + 52983958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d
^8*e^18 + 35090285461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*
e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8*e^18
+ 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 502813
16352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b
^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18 + ((e*cot(c + d*x))^(1/2)*(63*a^4
+ 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*(134217728*a^27*b^45*d^9*e^19
+ 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 12750684
1600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 1430626762752*a
^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137280*a^41*b
^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a^45*b^27*d
^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^
19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d^9*e^19 -
5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^19 - 14306
26762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 12750684160
0*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d
^9*e^19 - 134217728*a^69*b^3*d^9*e^19))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*
a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3))))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9
*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e
^3)^(1/2))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*
e^3)) + 117964800*a^21*b^42*d^6*e^15 + 841482240*a^23*b^40*d^6*e^15 - 38293

99552*a^25*b^38*d^6*e^15 - 78068580352*a^27*b^36*d^6*e^15 - 497438162944*a^29*b^34*d^6*e^15 - 1899895980032*a^31*b^32*d^6*e^15 - 4972695519232*a^33*b^30*d^6*e^15 - 9371195015168*a^35*b^28*d^6*e^15 - 12890720436224*a^37*b^26*d^6*e^15 - 12726089809920*a^39*b^24*d^6*e^15 - 8366961197056*a^41*b^22*d^6*e^15 - 2597662490624*a^43*b^20*d^6*e^15 + 1171836108800*a^45*b^18*d^6*e^15 + 1986881650688*a^47*b^16*d^6*e^15 + 1237583921152*a^49*b^14*d^6*e^15 + 449507753984*a^51*b^12*d^6*e^15 + 97476149248*a^53*b^10*d^6*e^15 + 11931222016*a^55*b^8*d^6*e^15 + 1006632960*a^57*b^6*d^6*e^15 + 134217728*a^59*b^4*d^6*e^15 + 8388608*a^61*b^2*d^6*e^15))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*1i)/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))/(58982400*a^22*b^35*d^4*e^12 + 920125440*a^24*b^33*d^4*e^12 + 6879444992*a^26*b^31*d^4*e^12 + 32454475776*a^28*b^29*d^4*e^12 + 107338792960*a^30*b^27*d^4*e^12 + 262062735360*a^32*b^25*d^4*e^12 + 485059461120*a^34*b^23*d^4*e^12 + 688908140544*a^36*b^21*d^4*e^12 + 751987064832*a^38*b^19*d^4*e^12 + 626086379520*a^40*b^17*d^4*e^12 + 390506741760*a^42*b^15*d^4*e^12 + 176637870080*a^44*b^13*d^4*e^12 + 54704996352*a^46*b^11*d^4*e^12 + 10374086656*a^48*b^9*d^4*e^12 + 908328960*a^50*b^7*d^4*e^12 + (((e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13) - ((63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13411815522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425905664*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^58*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 + 16777216*a^64*b^2*d^7*e^16) + ((63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*(251658240*a^24*b^45*d^8*e^18 + 5049942016*a^26*b^43*d^8*e^18 + 48368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^40*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8*e^18 + 2994733056000*a^54*b^15*d^8 *e^18 + 565576728576*a^56*b^13*d^8*e^18 - 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d^8*e^18 - ((e*cot(c + d*x))^(1/2)*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 + 22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 497276682240*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*a^39*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*b^29*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e^19 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 - 3121367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 497276682240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e^19))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3))))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)) - 117964800*a^21*b^42*d^6*e^15 - 841482240*a^23*b^40*d^6*e^15 + 3829399552*a^25*b^38*d^6*e^15 + 78068580352*a^27*b^36*d^6*e^15 + 497438162944*a^29*b^34*d^6*e^15 + 1899895980032*a^31*b^32*d^6*e^15 + 4972695519232*a^33*b^30*d^6*e^15 + 9371195015168*a^35*b^28*d^6*e^15 + 12890720436224*a^37*b^26*d^6*e^15 + 12726089809920*a^39*b^24*d^6*e^15 + 8366961197056*a^41*b^22*d^6*e^15 + 2597662490624*a^43*b^20*d^6*e^15 - 1171836108800*a^45*b^18*d^6*e^15 - 1986881650688*a^47*b^16*d^6*e^15 - 1237583921152*a^49*b^14*d^6*e^15 - 449507753984*a^51*b^12*d^6*e^15 - 97476149248*a^53*b^10*d^6*e^15 - 11931222016*a^55*b^8*d^6*e^15 - 1006632960*a^57*b^6*d^6*e^15 - 134217728*a^59*b^4*d^6*e^15 - 8388608*a^61*b^2*d^6*e^15))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)) - (((e*cot(c + d*x))^(1/2)*(7610564608*a^27*b^33*d^5*e^13 - 597688320*a^23*b^37*d^5*e^13 - 1671430144*a^25*b^35*d^5*e^13 - 58982400*a^21*b^39*d^5*e^13 + 85774565376*a^29*b^31*d^5*e^13 + 385487994880*a^31*b^29*d^5*e^13 + 1104303620096*a^33*b^27*d^5*e^13 + 2240523796480*a^35*b^25*d^5*e^13 + 3345249468416*a^37*b^23*d^5*e^13 + 3717287903232*a^39*b^21*d^5*e^13 + 3053967114240*a^41*b^19*d^5*e^13 + 1807474491392*a^43*b^17*d^5*e^13 + 726513221632*a^45*b^15*d^5*e^13 + 170768990208*a^47*b^13*d^5*e^13 + 10492051456*a^49*b^11*d^5*e^13 - 4917821440*a^51*b^9*d^5*e^13 - 923009024*a^53*b^7*d^5*e^13 + 8388608*a^55*b^5*d^5*e^13) - ((63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2)*((((e*cot(c + d*x))^(1/2)*(471859200*a^22*b^44*d^7*e^16 + 9500098560*a^24*b^42*d^7*e^16 + 91857354752*a^26*b^40*d^7*e^16 + 564502986752*a^28*b^38*d^7*e^16 + 2464648527872*a^30*b^36*d^7*e^16 + 8104469069824*a^32*b^34*d^7*e^16 + 20769933361152*a^34*b^32*d^7*e^16 + 42351565209600*a^36*b^30*d^7*e^16 + 69534945902592*a^38*b^28*d^7*e^16 + 92434029608960*a^40*b^26*d^7*e^16 + 99508717355008*a^42*b^24*d^7*e^16 + 86342935511040*a^44*b^22*d^7*e^16 + 59767095558144*a^46*b^20*d^7*e^16 + 32432589897728*a^48*b^18*d^7*e^16 + 13

411815522304*a^50*b^16*d^7*e^16 + 4030457708544*a^52*b^14*d^7*e^16 + 805425
905664*a^54*b^12*d^7*e^16 + 86608183296*a^56*b^10*d^7*e^16 + 1612709888*a^5
8*b^8*d^7*e^16 + 16777216*a^60*b^6*d^7*e^16 + 167772160*a^62*b^4*d^7*e^16 +
16777216*a^64*b^2*d^7*e^16) - ((63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^
3)^(1/2)*(251658240*a^24*b^45*d^8*e^18 + 5049942016*a^26*b^43*d^8*e^18 + 48
368713728*a^28*b^41*d^8*e^18 + 293819383808*a^30*b^39*d^8*e^18 + 1268458192
896*a^32*b^37*d^8*e^18 + 4132731617280*a^34*b^35*d^8*e^18 + 10531192700928*
a^36*b^33*d^8*e^18 + 21462823993344*a^38*b^31*d^8*e^18 + 35469618315264*a^4
0*b^29*d^8*e^18 + 47896904859648*a^42*b^27*d^8*e^18 + 52983958077440*a^44*b
^25*d^8*e^18 + 47896904859648*a^46*b^23*d^8*e^18 + 35090285461504*a^48*b^21
*d^8*e^18 + 20487396655104*a^50*b^19*d^8*e^18 + 9230622916608*a^52*b^17*d^8
*e^18 + 2994733056000*a^54*b^15*d^8*e^18 + 565576728576*a^56*b^13*d^8*e^18
- 18572378112*a^58*b^11*d^8*e^18 - 50281316352*a^60*b^9*d^8*e^18 - 16089350
144*a^62*b^7*d^8*e^18 - 2516582400*a^64*b^5*d^8*e^18 - 167772160*a^66*b^3*d
^8*e^18 + ((e*cot(c + d*x))^(1/2)*(63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*
e^3)^(1/2)*(134217728*a^27*b^45*d^9*e^19 + 2550136832*a^29*b^43*d^9*e^19 +
22817013760*a^31*b^41*d^9*e^19 + 127506841600*a^33*b^39*d^9*e^19 + 49727668
2240*a^35*b^37*d^9*e^19 + 1430626762752*a^37*b^35*d^9*e^19 + 3121367482368*
a^39*b^33*d^9*e^19 + 5202279137280*a^41*b^31*d^9*e^19 + 6502848921600*a^43*
b^29*d^9*e^19 + 5635802398720*a^45*b^27*d^9*e^19 + 2254320959488*a^47*b^25*
d^9*e^19 - 2254320959488*a^49*b^23*d^9*e^19 - 5635802398720*a^51*b^21*d^9*e
^19 - 6502848921600*a^53*b^19*d^9*e^19 - 5202279137280*a^55*b^17*d^9*e^19 -
3121367482368*a^57*b^15*d^9*e^19 - 1430626762752*a^59*b^13*d^9*e^19 - 4972
76682240*a^61*b^11*d^9*e^19 - 127506841600*a^63*b^9*d^9*e^19 - 22817013760*
a^65*b^7*d^9*e^19 - 2550136832*a^67*b^5*d^9*e^19 - 134217728*a^69*b^3*d^9*e
^19))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3))
))/(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(
63*a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2))/(8*(a^13*d*e^3 + a^7*b^
6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)) + 117964800*a^21*b^42*d^6*e^
15 + 841482240*a^23*b^40*d^6*e^15 - 3829399552*a^25*b^38*d^6*e^15 - 7806858
0352*a^27*b^36*d^6*e^15 - 497438162944*a^29*b^34*d^6*e^15 - 1899895980032*a
^31*b^32*d^6*e^15 - 4972695519232*a^33*b^30*d^6*e^15 - 9371195015168*a^35*b
^28*d^6*e^15 - 12890720436224*a^37*b^26*d^6*e^15 - 12726089809920*a^39*b^24
*d^6*e^15 - 8366961197056*a^41*b^22*d^6*e^15 - 2597662490624*a^43*b^20*d^6*
e^15 + 1171836108800*a^45*b^18*d^6*e^15 + 1986881650688*a^47*b^16*d^6*e^15
+ 1237583921152*a^49*b^14*d^6*e^15 + 449507753984*a^51*b^12*d^6*e^15 + 9747
6149248*a^53*b^10*d^6*e^15 + 11931222016*a^55*b^8*d^6*e^15 + 1006632960*a^5
7*b^6*d^6*e^15 + 134217728*a^59*b^4*d^6*e^15 + 8388608*a^61*b^2*d^6*e^15))/
(8*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3)))*(63*
a^4 + 15*b^4 + 46*a^2*b^2)*(-a^7*b^5*e^3)^(1/2))/(8*(a^13*d*e^3 + a^7*b^6*d
*e^3 + 3*a^9*b^4*d*e^3 + 3*a^11*b^2*d*e^3))))*(63*a^4 + 15*b^4 + 46*a^2*b^2
)*(-a^7*b^5*e^3)^(1/2)*1i)/(4*(a^13*d*e^3 + a^7*b^6*d*e^3 + 3*a^9*b^4*d*e^3
+ 3*a^11*b^2*d*e^3))

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\cot\left(c+dx\right)\right)^{\frac{3}{2}}\left(a+b\cot\left(c+dx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cot(d*x+c))**(3/2)/(a+b*cot(d*x+c))**3,x)
```

```
[Out] Integral(1/((e*cot(c + d*x))**(3/2)*(a + b*cot(c + d*x))**3), x)
```

3.88 $\int (a+b\cot(c+dx))^n\,dx$

Optimal. Leaf size=167

$$\frac{b(a+b\cot(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\cot(c+dx)}{a+\sqrt{-b^2}}\right)}{2\sqrt{-b^2}\,d(n+1)\left(a+\sqrt{-b^2}\right)}-\frac{b(a+b\cot(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\cot(c+dx)}{a-\sqrt{-b^2}}\right)}{2\sqrt{-b^2}\,d(n+1)\left(a-\sqrt{-b^2}\right)}$$

```
[Out] -1/2*b*(a+b*cot(d*x+c))^(1+n)*hypergeom([1, 1+n],[2+n],(a+b*cot(d*x+c))/(a-
(-b^2)^(1/2)))/d/(1+n)/(a-(-b^2)^(1/2))/(-b^2)^(1/2)+1/2*b*(a+b*cot(d*x+c))
^(1+n)*hypergeom([1, 1+n],[2+n],(a+b*cot(d*x+c))/(a+(-b^2)^(1/2)))/d/(1+n)/
(-b^2)^(1/2)/(a+(-b^2)^(1/2))
```

Rubi [A] time = 0.24, antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {3485, 712, 68}

$$\frac{b(a+b\cot(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\cot(c+dx)}{a+\sqrt{-b^2}}\right)}{2\sqrt{-b^2}\,d(n+1)\left(a+\sqrt{-b^2}\right)}-\frac{b(a+b\cot(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\cot(c+dx)}{a-\sqrt{-b^2}}\right)}{2\sqrt{-b^2}\,d(n+1)\left(a-\sqrt{-b^2}\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^n,x]
```

```
[Out] -(b*(a + b*Cot[c + d*x])^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (a + b*
Cot[c + d*x])/(a - Sqrt[-b^2])])/(2*Sqrt[-b^2]*(a - Sqrt[-b^2])*d*(1 + n))
+ (b*(a + b*Cot[c + d*x])^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (a + b
*Cot[c + d*x])/(a + Sqrt[-b^2])])/(2*Sqrt[-b^2]*(a + Sqrt[-b^2])*d*(1 + n))
```

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]
```

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 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (a+b\cot(c+dx))^n\,dx = -\frac{b\,\text{Subst}\left(\int \frac{(a+x)^n}{b^2+x^2}\,dx, x, b\cot(c+dx)\right)}{d}$$

$$= -\frac{b\,\text{Subst}\left(\int \left(\frac{\sqrt{-b^2}\,(a+x)^n}{2b^2\left(\sqrt{-b^2}-x\right)}+\frac{\sqrt{-b^2}\,(a+x)^n}{2b^2\left(\sqrt{-b^2}+x\right)}\right)dx, x, b\cot(c+dx)\right)}{d}$$

$$= \frac{b\,\text{Subst}\left(\int \frac{(a+x)^n}{\sqrt{-b^2}-x}\,dx, x, b\cot(c+dx)\right)}{2\sqrt{-b^2}\,d} + \frac{b\,\text{Subst}\left(\int \frac{(a+x)^n}{\sqrt{-b^2}+x}\,dx, x, b\cot(c+dx)\right)}{2\sqrt{-b^2}\,d}$$

$$= -\frac{b(a+b\cot(c+dx))^{1+n}\,{}_2F_1\left(1,1+n;2+n;\frac{a+b\cot(c+dx)}{a-\sqrt{-b^2}}\right)}{2\sqrt{-b^2}\left(a-\sqrt{-b^2}\right)d(1+n)} + \frac{b(a+b\cot(c+dx))^{1+n}}{2\sqrt{-b^2}\left(a\right.}$$

Mathematica [C] time = 0.30, size = 118, normalized size = 0.71

$$\frac{(a+b\cot(c+dx))^{n+1}\left((a+ib)\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\cot(c+dx)}{a-ib}\right)-(a-ib)\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\cot(c+dx)}{a+ib}\right)\right)}{2d(n+1)(a-ib)(b-ia)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^n,x]
```

```
[Out] ((a + b*Cot[c + d*x])^(1 + n)*((a + I*b)*Hypergeometric2F1[1, 1 + n, 2 + n,
 (a + b*Cot[c + d*x])/(a - I*b)] - (a - I*b)*Hypergeometric2F1[1, 1 + n, 2
+ n, (a + b*Cot[c + d*x])/(a + I*b)]))/(2*(a - I*b)*((-I)*a + b)*d*(1 + n))
```

fricas [F] time = 1.00, size = 0, normalized size = 0.00

$$\text{integral}\left((b\cot(dx+c)+a)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*cot(d*x + c) + a)^n, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot (dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^n,x, algorithm="giac")
[Out] integrate((b*cot(d*x + c) + a)^n, x)
```

maple [F] time = 1.24, size = 0, normalized size = 0.00

$$\int (a+b\cot (dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^n,x)
[Out] int((a+b*cot(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot (dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*cot(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\cot (c+d\,x))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*cot(c + d*x))^n,x)
[Out] int((a + b*cot(c + d*x))^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\cot (c+dx))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**n,x)
[Out] Integral((a + b*cot(c + d*x))**n, x)
```

3.89 $\int (a + b\cot(e + fx))^m (d\tan(e + fx))^n \, dx$

Optimal. Leaf size=193

$$-\frac{\cot(e+fx)(d\tan(e+fx))^n(a+b\cot(e+fx))^m\left(\frac{b\cot(e+fx)}{a}+1\right)^{-m}F_1\left(1-n;-m,1;2-n;-\frac{b\cot(e+fx)}{a},-i\cot(e-\right.}{2f(1-n)}$$

```
[Out] -1/2*AppellF1(1-n,1,-m,2-n,-I*cot(f*x+e),-b*cot(f*x+e)/a)*cot(f*x+e)*(a+b*c
ot(f*x+e))^m*(d*tan(f*x+e))^n/f/(1-n)/((1+b*cot(f*x+e)/a)^m)-1/2*AppellF1(1
-n,1,-m,2-n,I*cot(f*x+e),-b*cot(f*x+e)/a)*cot(f*x+e)*(a+b*cot(f*x+e))^m*(d*
tan(f*x+e))^n/f/(1-n)/((1+b*cot(f*x+e)/a)^m)
```

Rubi [A] time = 0.27, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4242, 3575, 912, 135, 133}

$$-\frac{\cot(e+fx)(d\tan(e+fx))^n(a+b\cot(e+fx))^m\left(\frac{b\cot(e+fx)}{a}+1\right)^{-m}F_1\left(1-n;-m,1;2-n;-\frac{b\cot(e+fx)}{a},-i\cot(e-\right.}{2f(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[e + f*x])^m*(d*Tan[e + f*x])^n,x]
```

```
[Out] -(AppellF1[1 - n, -m, 1, 2 - n, -((b*Cot[e + f*x])/a), (-I)*Cot[e + f*x]]*C
ot[e + f*x]*(a + b*Cot[e + f*x])^m*(d*Tan[e + f*x])^n)/(2*f*(1 - n)*(1 + (b
*Cot[e + f*x])/a)^m) - (AppellF1[1 - n, -m, 1, 2 - n, -((b*Cot[e + f*x])/a)
, I*Cot[e + f*x]]*Cot[e + f*x]*(a + b*Cot[e + f*x])^m*(d*Tan[e + f*x])^n)/(
2*f*(1 - n)*(1 + (b*Cot[e + f*x])/a)^m)
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 135

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Dist[(c^IntPart[n]*(c + d*x)^FracPart[n])/(1 + (d*x)/c)^FracPart
[n], Int[(b*x)^m*(1 + (d*x)/c)^n*(e + f*x)^p, x], x] /; FreeQ[{b, c, d, e,
f, m, n, p}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !GtQ[c, 0]
```

Rule 912

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_))/((a_) + (c_.)*(x_
)^2), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)^n, 1/(a + c*x^
2), x], x] /; FreeQ[{a, c, d, e, f, g, m, n}, x] && NeQ[c*d^2 + a*e^2, 0] &
&  !IntegerQ[m] &&  !IntegerQ[n]
```

Rule 3575

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)])^(n_), x_Symbol] :> With[{ff = FreeFactors[Tan[e + f*x], x]}, D
ist[ff/f, Subst[Int[((a + b*ff*x)^m*(c + d*ff*x)^n)/(1 + ff^2*x^2), x], x,
Tan[e + f*x]/ff], x]] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && NeQ[b*c - a*
d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0]
```

Rule 4242

```
Int[(u_)*((c_.)*tan[(a_.) + (b_.)*(x_)])^(m_.), x_Symbol] :> Dist[(c*Cot[a
+ b*x])^m*(c*Tan[a + b*x])^m, Int[ActivateTrig[u]/(c*Cot[a + b*x])^m, x], x
] /; FreeQ[{a, b, c, m}, x] &&  !IntegerQ[m] && KnownCotangentIntegrandQ[u,
 x]
```

Rubi steps

$$\int (a+b\cot(e+fx))^m (d\tan(e+fx))^n\,dx = \left((d\cot(e+fx))^n (d\tan(e+fx))^n\right)\int (d\cot(e+fx))^{-n}(a+b\cot(e+$$

$$= -\frac{\left((d\cot(e+fx))^n (d\tan(e+fx))^n\right)\text{Subst}\left(\int \frac{(dx)^{-n}(a+bx)^m}{1+x^2}\,dx, x, \cot(e\right.}{f}$$

$$= -\frac{\left((d\cot(e+fx))^n (d\tan(e+fx))^n\right)\text{Subst}\left(\int \left(\frac{i(dx)^{-n}(a+bx)^m}{2(i-x)}+\frac{i(dx)^{-n}(a}{2(i+}\right.\right.}{f}$$

$$= -\frac{\left(i(d\cot(e+fx))^n (d\tan(e+fx))^n\right)\text{Subst}\left(\int \frac{(dx)^{-n}(a+bx)^m}{i-x}\,dx, x, \cot(\right.}{2f}$$

$$= -\frac{\left(i(d\cot(e+fx))^n (a+b\cot(e+fx))^m \left(1+\frac{b\cot(e+fx)}{a}\right)^{-m}(d\tan(e+\right.}{2f}$$

$$= -\frac{F_1\left(1-n;-m,1;2-n;-\frac{b\cot(e+fx)}{a},-i\cot(e+fx)\right)\cot(e+fx)(a+b}{2f(1-n)}$$

Mathematica [F] time = 3.25, size = 0, normalized size = 0.00

$$\int (a+b\cot(e+fx))^m(d\tan(e+fx))^n\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Cot[e + f*x])^m*(d*Tan[e + f*x])^n,x]
[Out] Integrate[(a + b*Cot[e + f*x])^m*(d*Tan[e + f*x])^n, x]
```

fricas [F] time = 1.22, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b\cot\left(fx+e\right)+a\right)^m\left(d\tan\left(fx+e\right)\right)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(f*x+e))^m*(d*tan(f*x+e))^n,x, algorithm="fricas")
[Out] integral((b*cot(f*x + e) + a)^m*(d*tan(f*x + e))^n, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\cot\left(fx+e\right)+a\right)^m\left(d\tan\left(fx+e\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(f*x+e))^m*(d*tan(f*x+e))^n,x, algorithm="giac")
[Out] integrate((b*cot(f*x + e) + a)^m*(d*tan(f*x + e))^n, x)
```

maple [F] time = 2.42, size = 0, normalized size = 0.00

$$\int \left(a+b\cot\left(fx+e\right)\right)^m\left(d\tan\left(fx+e\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(f*x+e))^m*(d*tan(f*x+e))^n,x)
[Out] int((a+b*cot(f*x+e))^m*(d*tan(f*x+e))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\cot\left(fx+e\right)+a\right)^m\left(d\tan\left(fx+e\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(f*x+e))^m*(d*tan(f*x+e))^n,x, algorithm="maxima")
[Out] integrate((b*cot(f*x + e) + a)^m*(d*tan(f*x + e))^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(d\tan\left(e+f\,x\right)\right)^n\,\left(a+b\cot\left(e+f\,x\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*tan(e + f*x))^n*(a + b*cot(e + f*x))^m,x)
[Out] int((d*tan(e + f*x))^n*(a + b*cot(e + f*x))^m, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\tan\left(e+fx\right)\right)^n\left(a+b\cot\left(e+fx\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(f*x+e))**m*(d*tan(f*x+e))**n,x)
[Out] Integral((d*tan(e + f*x))**n*(a + b*cot(e + f*x))**m, x)
```

3.90 $\int \frac{1+i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx$

Optimal. Leaf size=45

$$\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}$$

```
[Out] 2*I*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/d/(a-I*b)^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {3537, 63, 208}

$$\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}$$

Antiderivative was successfully verified.

```
[In] Int[(1 + I*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] ((2*I)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/(Sqrt[a - I*b]*d)
```

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]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rubi steps

$$\int \frac{1+i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx = -\frac{i\,\mathrm{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a-ibx}}\,dx, x, i\cot(c+dx)\right)}{d}$$
$$= \frac{2\,\mathrm{Subst}\left(\int \frac{1}{-1-\frac{ia}{b}+\frac{ix^2}{b}}\,dx, x, \sqrt{a+b\cot(c+dx)}\right)}{bd}$$
$$= \frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{\sqrt{a-ib}\,d}$$

Mathematica [A] time = 0.08, size = 45, normalized size = 1.00

$$\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 + I*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] ((2*I)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/(Sqrt[a - I*b]*d)
```

fricas [B] time = 0.71, size = 159, normalized size = 3.53

$$-\frac{1}{2}\sqrt{-\frac{4i}{(i\,a+b)d^2}}\,\log\left(\frac{1}{2}\,(i\,a+b)d\sqrt{-\frac{4i}{(i\,a+b)d^2}}+\sqrt{\frac{(a+i\,b)e^{(2i\,dx+2i\,c)}-a+i\,b}{e^{(2i\,dx+2i\,c)}-1}}\right)+\frac{1}{2}\sqrt{-\frac{4i}{(i\,a+b)d^2}}\,\log\left(\frac{1}{2}\,(-i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -1/2*sqrt(-4*I/((I*a + b)*d^2))*log(1/2*(I*a + b)*d*sqrt(-4*I/((I*a + b)*d^
2)) + sqrt(((a + I*b)*e^(2*I*d*x + 2*I*c) - a + I*b)/(e^(2*I*d*x + 2*I*c) -
 1))) + 1/2*sqrt(-4*I/((I*a + b)*d^2))*log(1/2*(-I*a - b)*d*sqrt(-4*I/((I*a
 + b)*d^2)) + sqrt(((a + I*b)*e^(2*I*d*x + 2*I*c) - a + I*b)/(e^(2*I*d*x +
2*I*c) - 1)))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,\cot(dx+c)+1}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((I*cot(d*x + c) + 1)/sqrt(b*cot(d*x + c) + a), x)
```

maple [B] time = 0.46, size = 1622, normalized size = 36.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1+I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x)
```

```
[Out] I/d/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c)
)^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a+1/2
*I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)
*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))-1/2/d/(2*(a^2+b^2)^(1/2)+2*
a)^(1/2)/(a^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*b-I/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*a
rctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)
^(1/2)-2*a)^(1/2))-1/2*I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/((a^2+b^2)^(1/2)*a
+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x
+c)-a-(a^2+b^2)^(1/2))*b^2-1/d/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2
)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b
^2)^(1/2)-2*a)^(1/2))*b-I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/((a^2+b^2)^(1/2)*
a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*
x+c)-a-(a^2+b^2)^(1/2))*a^2-I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/
2)/((a^2+b^2)^(1/2)*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)
+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*a^3-I/d/(2*(a^2+b^2)^(1/2)+2*a)
^(1/2)/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2
)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*a*b^2+1/2*I
/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a+(a+b*cot
(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*a+1/2/d/(2*(a
^2+b^2)^(1/2)+2*a)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1
/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*a*b+1/2/d
/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)*
ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2
+b^2)^(1/2))*a^2*b+1/2/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)/((a^
2+b^2)^(1/2)*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(
1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*b^3+I/d/((a^2+b^2)^(1/2)*a+a^2+b^2)/(2
*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*co
t(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*b^2+1/d/((a^2+b^2)^(1/2)*a+
a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2
)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a*b+1/d/(a^2+b^2
)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((
```

```
2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2
*a)^(1/2))*a^2*b+1/d/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)/(2*(a^2+b^
2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c)
)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*b^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\cot(dx+c)+1}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((I*cot(d*x + c) + 1)/sqrt(b*cot(d*x + c) + a), x)
```

mupad [B] time = 2.54, size = 1410, normalized size = 31.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((cot(c + d*x)*1i + 1)/(a + b*cot(c + d*x))^(1/2),x)
```

```
[Out] (log(d*(-1/(d^2*(a - b*1i)))^(1/2)*(a + b*cot(c + d*x))^(1/2) + 1i)*(-1/(a*
d^2 - b*d^2*1i))^(1/2))/2 - log(d*(-1/(d^2*(a - b*1i)))^(1/2)*(a + b*cot(c
+ d*x))^(1/2)*1i + 1)*(-1/(4*(a*d^2 - b*d^2*1i)))^(1/2) + (log(16*b^3*d*(-1
/(d^2*(a - b*1i)))^(1/2) - 16*b^2*(a + b*cot(c + d*x))^(1/2) + (16*a*b^2*(a
 + b*cot(c + d*x))^(1/2))/(a - b*1i))*(-1/(a*d^2 - b*d^2*1i))^(1/2))/2 - lo
g(16*b^2*(a + b*cot(c + d*x))^(1/2) + 16*b^3*d*(-1/(d^2*(a - b*1i)))^(1/2)
- (16*a*b^2*(a + b*cot(c + d*x))^(1/2))/(a - b*1i))*(-1/(4*(a*d^2 - b*d^2*1
i)))^(1/2) - 2*atanh((32*b^2*(a + b*cot(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2
+ 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2))^(1/2))/((b^4*d^2*64i)/(4*a^2*d^3
+ 4*b^2*d^3) - (64*a*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) + (a*b^3*(a + b*cot(
c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2)
)^(1/2)*128i)/((b^6*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) + (a^2*b^4*d^2*256i)/
(4*a^2*d^3 + 4*b^2*d^3) - (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) - (256*
a*b^5*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) - (128*a^2*b^2*(a + b*cot(c + d*x))^(1/
2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2))^(1/2))/((b^
6*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) + (a^2*b^4*d^2*256i)/(4*a^2*d^3 + 4*b^2
*d^3) - (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) - (256*a*b^5*d^2)/(4*a^2*
d^3 + 4*b^2*d^3)))*(-(a - b*1i)/(4*a^2*d^2 + 4*b^2*d^2))^(1/2) - 2*atanh((3
2*b^2*(a + b*cot(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2
*d^2 + 4*b^2*d^2))^(1/2))/((a^2*b^2*d^2*64i)/(4*a^2*d^3 + 4*b^2*d^3) - (b^2
*16i)/d + (64*a*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) - (128*a^2*b^2*(a + b*cot
(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2
```

```
))^(1/2))/((a^2*b^4*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) - (a^2*b^2*64i)/d - (
b^4*64i)/d + (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) + (a^4*b^2*d^2*256i)
/(4*a^2*d^3 + 4*b^2*d^3) + (256*a*b^5*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) + (a*b^
3*(a + b*cot(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2
 + 4*b^2*d^2))^(1/2)*128i)/((a^2*b^4*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) - (a
^2*b^2*64i)/d - (b^4*64i)/d + (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) + (
a^4*b^2*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) + (256*a*b^5*d^2)/(4*a^2*d^3 + 4*
b^2*d^3)))*(-(a - b*1i)/(4*a^2*d^2 + 4*b^2*d^2))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$i\left(\int\left(-\frac{i}{\sqrt{a+b\cot(c+dx)}}\right)dx+\int\frac{\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1+I*cot(d*x+c))/(a+b*cot(d*x+c))**(1/2),x)
```

```
[Out] I*(Integral(-I/sqrt(a + b*cot(c + d*x)), x) + Integral(cot(c + d*x)/sqrt(a
+ b*cot(c + d*x)), x))
```

3.91 $\int \frac{1-i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx$

Optimal. Leaf size=45

$$-\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}$$

[Out] -2*I*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/d/(a+I*b)^(1/2)

Rubi [A] time = 0.06, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {3537, 63, 208}

$$-\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}$$

Antiderivative was successfully verified.

[In] Int[(1 - I*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]

[Out] ((-2*I)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/(Sqrt[a + I*b]*d)

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]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rubi steps

$$\int \frac{1-i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx = \frac{i\,\text{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a+ibx}}\,dx, x, -i\cot(c+dx)\right)}{d}$$
$$= \frac{2\,\text{Subst}\left(\int \frac{1}{-1+\frac{ia}{b}-\frac{ix^2}{b}}\,dx, x, \sqrt{a+b\cot(c+dx)}\right)}{bd}$$
$$= -\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{\sqrt{a+ib}\,d}$$

Mathematica [A] time = 1.72, size = 70, normalized size = 1.56

$$-\frac{2i\tanh^{-1}\left(\frac{\sqrt{a+\frac{ib\left(1+e^{2i(c+dx)}\right)}{-1+e^{2i(c+dx)}}}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(1 - I*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] ((-2*I)*ArcTanh[Sqrt[a + (I*b*(1 + E^((2*I)*(c + d*x))))/(-1 + E^((2*I)*(c
+ d*x)))]/Sqrt[a + I*b]])/(Sqrt[a + I*b]*d)
```

fricas [B] time = 0.59, size = 159, normalized size = 3.53

$$\frac{1}{2}\sqrt{\frac{4i}{(-i\,a+b)d^2}}\,\log\left(\frac{1}{2}\,(i\,a-b)d\sqrt{\frac{4i}{(-i\,a+b)d^2}}+\sqrt{\frac{(a+i\,b)e^{(2i\,dx+2i\,c)}-a+i\,b}{e^{(2i\,dx+2i\,c)}-1}}\right)-\frac{1}{2}\sqrt{\frac{4i}{(-i\,a+b)d^2}}\,\log\left(\frac{1}{2}\,(-i\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1-I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*sqrt(4*I/((-I*a + b)*d^2))*log(1/2*(I*a - b)*d*sqrt(4*I/((-I*a + b)*d^2
)) + sqrt(((a + I*b)*e^(2*I*d*x + 2*I*c) - a + I*b)/(e^(2*I*d*x + 2*I*c) -
1))) - 1/2*sqrt(4*I/((-I*a + b)*d^2))*log(1/2*(-I*a + b)*d*sqrt(4*I/((-I*a
+ b)*d^2)) + sqrt(((a + I*b)*e^(2*I*d*x + 2*I*c) - a + I*b)/(e^(2*I*d*x + 2
*I*c) - 1)))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{-i\,\cot(dx+c)+1}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1-I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((-I*cot(d*x + c) + 1)/sqrt(b*cot(d*x + c) + a), x)
```

maple [B] time = 0.54, size = 1622, normalized size = 36.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((1-I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x)
```

```
[Out] I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^
2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(
a^2+b^2)^(1/2))*a*b^2+I/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(
d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))
-1/2/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a+(a+b
*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*b-I/d/((a
^2+b^2)^(1/2)*a+a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)
^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*
b^2+I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^
2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)
-a-(a^2+b^2)^(1/2))*a^3-1/d/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*a
rctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)
^(1/2)-2*a)^(1/2))*b+1/2*I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/((a^2+b^2)^(1/2)
*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d
*x+c)-a-(a^2+b^2)^(1/2))*b^2-1/2*I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2
)^(1/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)+(a^2+b^2)^(1/2))*a+I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/((a^2+b^2)^(1/2)*a
+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x
+c)-a-(a^2+b^2)^(1/2))*a^2-1/2*I/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*ln(b*cot(d
*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2
))+1/2/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)*ln((a+b*
cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1
/2))*a*b+1/2/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/
2)*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot
(d*x+c)-a-(a^2+b^2)^(1/2))*a^2*b+1/2/d/(2*(a^2+b^2)^(1/2)+2*a)^(1/2)/(a^2+b
^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2
)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*b^3-I/d/(a^2+b^2)^(1/2)/
(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)
^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a+1/d/((a^2+b^2)^(1/2)*a+
a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2
)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a*b+1/d/(a^2+b^2
)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((
```

```
2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2
*a)^(1/2))*a^2*b+1/d/(a^2+b^2)^(1/2)/((a^2+b^2)^(1/2)*a+a^2+b^2)/(2*(a^2+b^
2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c)
)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*b^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{-i\cot(dx+c)+1}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1-I*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((-I*cot(d*x + c) + 1)/sqrt(b*cot(d*x + c) + a), x)
```

mupad [B] time = 1.40, size = 1410, normalized size = 31.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(cot(c + d*x)*1i - 1)/(a + b*cot(c + d*x))^(1/2),x)
```

```
[Out] (log(d*(-1/(d^2*(a - b*1i)))^(1/2)*(a + b*cot(c + d*x))^(1/2)*1i + 1)*(-1/(
a*d^2 - b*d^2*1i))^(1/2))/2 - log(d*(-1/(d^2*(a - b*1i)))^(1/2)*(a + b*cot(
c + d*x))^(1/2) + 1i)*(-1/(4*(a*d^2 - b*d^2*1i)))^(1/2) + (log(16*b^3*d*(-1
/(d^2*(a - b*1i)))^(1/2) - 16*b^2*(a + b*cot(c + d*x))^(1/2) + (16*a*b^2*(a
 + b*cot(c + d*x))^(1/2))/(a - b*1i))*(-1/(a*d^2 - b*d^2*1i))^(1/2))/2 - lo
g(16*b^2*(a + b*cot(c + d*x))^(1/2) + 16*b^3*d*(-1/(d^2*(a - b*1i)))^(1/2)
- (16*a*b^2*(a + b*cot(c + d*x))^(1/2))/(a - b*1i))*(-1/(4*(a*d^2 - b*d^2*1
i)))^(1/2) - 2*atanh((32*b^2*(a + b*cot(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2
+ 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2))^(1/2))/((b^4*d^2*64i)/(4*a^2*d^3
+ 4*b^2*d^3) - (64*a*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) + (a*b^3*(a + b*cot(
c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2)
)^(1/2)*128i)/((b^6*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) + (a^2*b^4*d^2*256i)/
(4*a^2*d^3 + 4*b^2*d^3) - (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) - (256*
a*b^5*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) - (128*a^2*b^2*(a + b*cot(c + d*x))^(1/
2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2))^(1/2))/((b^
6*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) + (a^2*b^4*d^2*256i)/(4*a^2*d^3 + 4*b^2
*d^3) - (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) - (256*a*b^5*d^2)/(4*a^2*
d^3 + 4*b^2*d^3)))*(-(a - b*1i)/(4*a^2*d^2 + 4*b^2*d^2))^(1/2) + 2*atanh((3
2*b^2*(a + b*cot(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2
*d^2 + 4*b^2*d^2))^(1/2))/((a^2*b^2*d^2*64i)/(4*a^2*d^3 + 4*b^2*d^3) - (b^2
*16i)/d + (64*a*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) - (128*a^2*b^2*(a + b*cot
(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2 + 4*b^2*d^2
```

```
))^(1/2))/((a^2*b^4*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) - (a^2*b^2*64i)/d - (
b^4*64i)/d + (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) + (a^4*b^2*d^2*256i)
/(4*a^2*d^3 + 4*b^2*d^3) + (256*a*b^5*d^2)/(4*a^2*d^3 + 4*b^2*d^3)) + (a*b^
3*(a + b*cot(c + d*x))^(1/2)*((b*1i)/(4*a^2*d^2 + 4*b^2*d^2) - a/(4*a^2*d^2
 + 4*b^2*d^2))^(1/2)*128i)/((a^2*b^4*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) - (a
^2*b^2*64i)/d - (b^4*64i)/d + (256*a^3*b^3*d^2)/(4*a^2*d^3 + 4*b^2*d^3) + (
a^4*b^2*d^2*256i)/(4*a^2*d^3 + 4*b^2*d^3) + (256*a*b^5*d^2)/(4*a^2*d^3 + 4*
b^2*d^3)))*(-(a - b*1i)/(4*a^2*d^2 + 4*b^2*d^2))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-i\left(\int \frac{i}{\sqrt{a+b\cot(c+dx)}}\,dx+\int \frac{\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((1-I*cot(d*x+c))/(a+b*cot(d*x+c))**(1/2),x)
```

```
[Out] -I*(Integral(I/sqrt(a + b*cot(c + d*x)), x) + Integral(cot(c + d*x)/sqrt(a
+ b*cot(c + d*x)), x))
```

3.92 $\int \frac{A+B\cot(c+dx)}{a+b\cot(c+dx)}\,dx$

Optimal. Leaf size=59

$$\frac{x(aA+bB)}{a^2+b^2}-\frac{(Ab-aB)\log(a\sin(c+dx)+b\cos(c+dx))}{d\left(a^2+b^2\right)}$$

```
[Out] (A*a+B*b)*x/(a^2+b^2)-(A*b-B*a)*ln(b*cos(d*x+c)+a*sin(d*x+c))/(a^2+b^2)/d
```

Rubi [A] time = 0.08, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {3531, 3530}

$$\frac{x(aA+bB)}{a^2+b^2}-\frac{(Ab-aB)\log(a\sin(c+dx)+b\cos(c+dx))}{d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x]),x]
```

```
[Out] ((a*A + b*B)*x)/(a^2 + b^2) - ((A*b - a*B)*Log[b*Cos[c + d*x] + a*Sin[c + d
*x]])/((a^2 + b^2)*d)
```

Rule 3530

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/((a_) + (b_.)*tan[(e_.) + (f_.)*
(x_)]), x_Symbol] :> Simp[(c*Log[RemoveContent[a*Cos[e + f*x] + b*Sin[e + f
*x], x]])/(b*f), x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 NeQ[a^2 + b^2, 0] && EqQ[a*c + b*d, 0]
```

Rule 3531

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/((a_.) + (b_.)*tan[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[((a*c + b*d)*x)/(a^2 + b^2), x] + Dist[(b*c - a
*d)/(a^2 + b^2), Int[(b - a*Tan[e + f*x])/(a + b*Tan[e + f*x]), x], x] /; F
reeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && Ne
Q[a*c + b*d, 0]
```

Rubi steps

$$\int \frac{A+B\cot(c+dx)}{a+b\cot(c+dx)}\,dx = \frac{(aA+bB)x}{a^2+b^2} - \frac{(Ab-aB)\int \frac{-b+a\cot(c+dx)}{a+b\cot(c+dx)}\,dx}{a^2+b^2}$$
$$= \frac{(aA+bB)x}{a^2+b^2} - \frac{(Ab-aB)\log(b\cos(c+dx)+a\sin(c+dx))}{(a^2+b^2)\,d}$$

Mathematica [**A**] time = 0.13, size = 67, normalized size = 1.14

$$-\frac{2(aA+bB)\tan^{-1}(\cot(c+dx)) + (Ab-aB)\left(2\log(a+b\cot(c+dx)) - \log\left(\csc^2(c+dx)\right)\right)}{2d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x]),x]
```

```
[Out] -1/2*(2*(a*A + b*B)*ArcTan[Cot[c + d*x]] + (A*b - a*B)*(2*Log[a + b*Cot[c +
 d*x]] - Log[Csc[c + d*x]^2]))/((a^2 + b^2)*d)
```

fricas [**A**] time = 0.55, size = 79, normalized size = 1.34

$$\frac{2\,(Aa+Bb)dx + (Ba-Ab)\log\left(ab\sin\left(2\,dx+2\,c\right) + \frac{1}{2}\,a^2 + \frac{1}{2}\,b^2 - \frac{1}{2}\left(a^2-b^2\right)\cos\left(2\,dx+2\,c\right)\right)}{2\left(a^2+b^2\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(A*a + B*b)*d*x + (B*a - A*b)*log(a*b*sin(2*d*x + 2*c) + 1/2*a^2 + 1
/2*b^2 - 1/2*(a^2 - b^2)*cos(2*d*x + 2*c)))/((a^2 + b^2)*d)
```

giac [**A**] time = 0.53, size = 95, normalized size = 1.61

$$\frac{\frac{2\,(Aa+Bb)(dx+c)}{a^2+b^2} - \frac{(Ba-Ab)\log\left(\tan(dx+c)^2+1\right)}{a^2+b^2} + \frac{2\left(Ba^2-Aab\right)\log(|a\tan(dx+c)+b|)}{a^3+ab^2}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*(2*(A*a + B*b)*(d*x + c)/(a^2 + b^2) - (B*a - A*b)*log(tan(d*x + c)^2 +
 1)/(a^2 + b^2) + 2*(B*a^2 - A*a*b)*log(abs(a*tan(d*x + c) + b))/(a^3 + a*b
^2))/d
```

maple [B] time = 0.42, size = 187, normalized size = 3.17

$$-\frac{\ln\left(a+b\cot\left(dx+c\right)\right)Ab}{d\left(a^{2}+b^{2}\right)}+\frac{\ln\left(a+b\cot\left(dx+c\right)\right)aB}{d\left(a^{2}+b^{2}\right)}+\frac{\ln\left(\cot^{2}\left(dx+c\right)+1\right)Ab}{2d\left(a^{2}+b^{2}\right)}-\frac{\ln\left(\cot^{2}\left(dx+c\right)+1\right)aB}{2d\left(a^{2}+b^{2}\right)}-\frac{}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*cot(d*x+c))/(a+b*cot(d*x+c)),x)
```

```
[Out] -1/d/(a^2+b^2)*ln(a+b*cot(d*x+c))*A*b+1/d/(a^2+b^2)*ln(a+b*cot(d*x+c))*a*B+
1/2/d/(a^2+b^2)*ln(cot(d*x+c)^2+1)*A*b-1/2/d/(a^2+b^2)*ln(cot(d*x+c)^2+1)*a
*B-1/2/d/(a^2+b^2)*A*Pi*a-1/2/d/(a^2+b^2)*B*Pi*b+1/d/(a^2+b^2)*A*arccot(cot
(d*x+c))*a+1/d/(a^2+b^2)*B*arccot(cot(d*x+c))*b
```

maxima [A] time = 1.69, size = 89, normalized size = 1.51

$$\frac{\frac{2\,(Aa+Bb)(dx+c)}{a^{2}+b^{2}}+\frac{2\,(Ba-Ab)\log(a\tan(dx+c)+b)}{a^{2}+b^{2}}-\frac{(Ba-Ab)\log\left(\tan(dx+c)^{2}+1\right)}{a^{2}+b^{2}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*(2*(A*a + B*b)*(d*x + c)/(a^2 + b^2) + 2*(B*a - A*b)*log(a*tan(d*x + c)
 + b)/(a^2 + b^2) - (B*a - A*b)*log(tan(d*x + c)^2 + 1)/(a^2 + b^2))/d
```

mupad [B] time = 1.00, size = 155, normalized size = 2.63

$$\frac{A\,\ln\left(\cot\left(c+d\,x\right)+1\mathrm{i}\right)}{2\,\left(b\,d+a\,d\,1\mathrm{i}\right)}-\frac{B\,\ln\left(\cot\left(c+d\,x\right)+1\mathrm{i}\right)}{2\,\left(a\,d-b\,d\,1\mathrm{i}\right)}-\frac{A\,b\,\ln\left(a+b\cot\left(c+d\,x\right)\right)}{d\,\left(a^{2}+b^{2}\right)}+\frac{B\,a\,\ln\left(a+b\cot\left(c+d\,x\right)\right)}{d\,\left(a^{2}+b^{2}\right)}+\frac{A\,\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))/(a + b*cot(c + d*x)),x)
```

```
[Out] (A*log(cot(c + d*x) - 1i)*1i)/(2*(a*d + b*d*1i)) + (A*log(cot(c + d*x) + 1i
))/(2*(a*d*1i + b*d)) - (B*log(cot(c + d*x) + 1i))/(2*(a*d - b*d*1i)) - (B*
log(cot(c + d*x) - 1i)*1i)/(2*(a*d*1i - b*d)) - (A*b*log(a + b*cot(c + d*x)
))/(d*(a^2 + b^2)) + (B*a*log(a + b*cot(c + d*x)))/(d*(a^2 + b^2))
```

sympy [A] time = 1.11, size = 534, normalized size = 9.05

$$\begin{cases} \frac{\tilde{\infty}x(A+B\cot(c))}{\cot(c)} \\ \frac{\frac{A\log(\tan^2(c+dx)+1)}{2d}+Bx}{b} \\ -\frac{iAdx\cot(c+dx)}{-2bd\cot(c+dx)+2ibd}-\frac{Adx}{-2bd\cot(c+dx)+2ibd}+\frac{iA}{-2bd\cot(c+dx)+2ibd}-\frac{Bdx\cot(c+dx)}{-2bd\cot(c+dx)+2ibd}+\frac{iBdx}{-2bd\cot(c+dx)+2ibd}-\frac{B}{-2bd\cot(c+dx)+2ibd} \\ \frac{iAdx\cot(c+dx)}{-2bd\cot(c+dx)-2ibd}-\frac{Adx}{-2bd\cot(c+dx)-2ibd}-\frac{iA}{-2bd\cot(c+dx)-2ibd}-\frac{Bdx\cot(c+dx)}{-2bd\cot(c+dx)-2ibd}-\frac{iBdx}{-2bd\cot(c+dx)-2ibd}-\frac{B}{-2bd\cot(c+dx)-2ibd} \\ \frac{x(A+B\cot(c))}{a+b\cot(c)} \\ \frac{2Aadx}{2a^2d+2b^2d}-\frac{2Ab\log\left(\tan(c+dx)+\frac{b}{a}\right)}{2a^2d+2b^2d}+\frac{Ab\log\left(\tan^2(c+dx)+1\right)}{2a^2d+2b^2d}+\frac{2Ba\log\left(\tan(c+dx)+\frac{b}{a}\right)}{2a^2d+2b^2d}-\frac{Ba\log\left(\tan^2(c+dx)+1\right)}{2a^2d+2b^2d}+\frac{2Bbdx}{2a^2d+2b^2d} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c)),x)
```

```
[Out] Piecewise((zoo*x*(A + B*cot(c))/cot(c), Eq(a, 0) & Eq(b, 0) & Eq(d, 0)), ((
A*log(tan(c + d*x)**2 + 1)/(2*d) + B*x)/b, Eq(a, 0)), (-I*A*d*x*cot(c + d*x
)/(-2*b*d*cot(c + d*x) + 2*I*b*d) - A*d*x/(-2*b*d*cot(c + d*x) + 2*I*b*d) +
 I*A/(-2*b*d*cot(c + d*x) + 2*I*b*d) - B*d*x*cot(c + d*x)/(-2*b*d*cot(c + d
*x) + 2*I*b*d) + I*B*d*x/(-2*b*d*cot(c + d*x) + 2*I*b*d) - B/(-2*b*d*cot(c
+ d*x) + 2*I*b*d), Eq(a, -I*b)), (I*A*d*x*cot(c + d*x)/(-2*b*d*cot(c + d*x)
 - 2*I*b*d) - A*d*x/(-2*b*d*cot(c + d*x) - 2*I*b*d) - I*A/(-2*b*d*cot(c + d
*x) - 2*I*b*d) - B*d*x*cot(c + d*x)/(-2*b*d*cot(c + d*x) - 2*I*b*d) - I*B*d
*x/(-2*b*d*cot(c + d*x) - 2*I*b*d) - B/(-2*b*d*cot(c + d*x) - 2*I*b*d), Eq(
a, I*b)), (x*(A + B*cot(c))/(a + b*cot(c)), Eq(d, 0)), (2*A*a*d*x/(2*a**2*d
 + 2*b**2*d) - 2*A*b*log(tan(c + d*x) + b/a)/(2*a**2*d + 2*b**2*d) + A*b*lo
g(tan(c + d*x)**2 + 1)/(2*a**2*d + 2*b**2*d) + 2*B*a*log(tan(c + d*x) + b/a
)/(2*a**2*d + 2*b**2*d) - B*a*log(tan(c + d*x)**2 + 1)/(2*a**2*d + 2*b**2*d
) + 2*B*b*d*x/(2*a**2*d + 2*b**2*d), True))
```

3.93 $\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^2}\,dx$

Optimal. Leaf size=111

$$\frac{Ab-aB}{d\left(a^2+b^2\right)(a+b\cot(c+dx))}-\frac{\left(a^2(-B)+2aAb+b^2B\right)\log(a\sin(c+dx)+b\cos(c+dx))}{d\left(a^2+b^2\right)^2}+\frac{x\left(a^2A+2abB-Ab\right.}{\left(a^2+b^2\right)^2}$$

```
[Out] (A*a^2-A*b^2+2*B*a*b)*x/(a^2+b^2)^2+(A*b-B*a)/(a^2+b^2)/d/(a+b*cot(d*x+c))-
(2*A*a*b-B*a^2+B*b^2)*ln(b*cos(d*x+c)+a*sin(d*x+c))/(a^2+b^2)^2/d
```

Rubi [A] time = 0.15, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3529, 3531, 3530}

$$\frac{Ab-aB}{d\left(a^2+b^2\right)(a+b\cot(c+dx))}-\frac{\left(a^2(-B)+2aAb+b^2B\right)\log(a\sin(c+dx)+b\cos(c+dx))}{d\left(a^2+b^2\right)^2}+\frac{x\left(a^2A+2abB-Ab\right.}{\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] ((a^2*A - A*b^2 + 2*a*b*B)*x)/(a^2 + b^2)^2 + (A*b - a*B)/((a^2 + b^2)*d*(a
 + b*Cot[c + d*x])) - ((2*a*A*b - a^2*B + b^2*B)*Log[b*Cos[c + d*x] + a*Sin
[c + d*x]])/((a^2 + b^2)^2*d)
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3530

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/((a_) + (b_.)*tan[(e_.) + (f_.)*
(x_)]), x_Symbol] :> Simp[(c*Log[RemoveContent[a*Cos[e + f*x] + b*Sin[e + f
*x], x]])/(b*f), x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 NeQ[a^2 + b^2, 0] && EqQ[a*c + b*d, 0]
```

Rule 3531

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/((a_.) + (b_.)*tan[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[((a*c + b*d)*x)/(a^2 + b^2), x] + Dist[(b*c - a
```

```
*d)/(a^2 + b^2), Int[(b - a*Tan[e + f*x])/(a + b*Tan[e + f*x]), x], x] /; F
reeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && Ne
Q[a*c + b*d, 0]
```

Rubi steps

$$\int \frac{A + B\cot(c+dx)}{(a+b\cot(c+dx))^2}\,dx = \frac{Ab - aB}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} + \frac{\int \frac{aA+bB-(Ab-aB)\cot(c+dx)}{a+b\cot(c+dx)}\,dx}{a^2+b^2}$$

$$= \frac{\left(a^2A - Ab^2 + 2abB\right)x}{\left(a^2+b^2\right)^2} + \frac{Ab-aB}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(2aAb - a^2B + b^2B\right)\int \frac{-b+}{a+}}{\left(a^2+b^2\right)^2}$$

$$= \frac{\left(a^2A - Ab^2 + 2abB\right)x}{\left(a^2+b^2\right)^2} + \frac{Ab-aB}{\left(a^2+b^2\right)d(a+b\cot(c+dx))} - \frac{\left(2aAb - a^2B + b^2B\right)\log(b}{(a^2 +}$$

Mathematica [C] time = 1.93, size = 144, normalized size = 1.30

$$\frac{\frac{2b(aB-Ab)}{a\left(a^2+b^2\right)(a\tan(c+dx)+b)} + \frac{2\left(a^2B-2aAb-b^2B\right)\log(a\tan(c+dx)+b)}{\left(a^2+b^2\right)^2} - \frac{(B+iA)\log(-\tan(c+dx)+i)}{(a-ib)^2} + \frac{i(A+iB)\log(\tan(c+dx)+i)}{(a+ib)^2}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^2,x]
```

```
[Out] (-(((I*A + B)*Log[I - Tan[c + d*x]])/(a - I*b)^2) + (I*(A + I*B)*Log[I + Ta
n[c + d*x]])/(a + I*b)^2 + (2*(-2*a*A*b + a^2*B - b^2*B)*Log[b + a*Tan[c +
d*x]])/(a^2 + b^2)^2 + (2*b*(-(A*b) + a*B))/(a*(a^2 + b^2)*(b + a*Tan[c + d
*x])))/(2*d)
```

fricas [B] time = 0.56, size = 340, normalized size = 3.06

$$\frac{2\,Ba^2b - 2\,Aab^2 + 2\left(Aa^2b + 2\,Bab^2 - Ab^3\right)dx + 2\left(Ba^2b - Aab^2 + \left(Aa^2b + 2\,Bab^2 - Ab^3\right)dx\right)\cos\left(2\,dx + 2\,c\right) + (}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/2*(2*B*a^2*b - 2*A*a*b^2 + 2*(A*a^2*b + 2*B*a*b^2 - A*b^3)*d*x + 2*(B*a^2
*b - A*a*b^2 + (A*a^2*b + 2*B*a*b^2 - A*b^3)*d*x)*cos(2*d*x + 2*c) + (B*a^2
```

```
*b - 2*A*a*b^2 - B*b^3 + (B*a^2*b - 2*A*a*b^2 - B*b^3)*cos(2*d*x + 2*c) + (
B*a^3 - 2*A*a^2*b - B*a*b^2)*sin(2*d*x + 2*c))*log(a*b*sin(2*d*x + 2*c) + 1
/2*a^2 + 1/2*b^2 - 1/2*(a^2 - b^2)*cos(2*d*x + 2*c)) - 2*(B*a*b^2 - A*b^3 -
 (A*a^3 + 2*B*a^2*b - A*a*b^2)*d*x)*sin(2*d*x + 2*c))/((a^4*b + 2*a^2*b^3 +
 b^5)*d*cos(2*d*x + 2*c) + (a^5 + 2*a^3*b^2 + a*b^4)*d*sin(2*d*x + 2*c) + (
a^4*b + 2*a^2*b^3 + b^5)*d)
```

giac [B] time = 0.49, size = 241, normalized size = 2.17

$$\frac{\frac{2\left(Aa^2+2\,Bab-Ab^2\right)(dx+c)}{a^4+2\,a^2b^2+b^4}-\frac{\left(Ba^2-2\,Aab-Bb^2\right)\log\left(\tan(dx+c)^2+1\right)}{a^4+2\,a^2b^2+b^4}+\frac{2\left(Ba^3-2\,Aa^2b-Bab^2\right)\log(|a\tan(dx+c)+b|)}{a^5+2\,a^3b^2+ab^4}-\frac{2\left(Ba^4\tan(dx+c)-2\,Aa^3b\tan\right.}{\left(a^5+2\right.}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(2*(A*a^2 + 2*B*a*b - A*b^2)*(d*x + c)/(a^4 + 2*a^2*b^2 + b^4) - (B*a^2
 - 2*A*a*b - B*b^2)*log(tan(d*x + c)^2 + 1)/(a^4 + 2*a^2*b^2 + b^4) + 2*(B*
a^3 - 2*A*a^2*b - B*a*b^2)*log(abs(a*tan(d*x + c) + b))/(a^5 + 2*a^3*b^2 +
a*b^4) - 2*(B*a^4*tan(d*x + c) - 2*A*a^3*b*tan(d*x + c) - B*a^2*b^2*tan(d*x
 + c) - A*a^2*b^2 - 2*B*a*b^3 + A*b^4)/((a^5 + 2*a^3*b^2 + a*b^4)*(a*tan(d*
x + c) + b)))/d
```

maple [B] time = 0.37, size = 356, normalized size = 3.21

$$\frac{Ab}{d\left(a^2+b^2\right)\left(a+b\cot\left(dx+c\right)\right)}-\frac{aB}{d\left(a^2+b^2\right)\left(a+b\cot\left(dx+c\right)\right)}-\frac{2\ln\left(a+b\cot\left(dx+c\right)\right)Aab}{d\left(a^2+b^2\right)^2}+\frac{\ln\left(a+b\cot\left(dx\right.\right.}{d\left(a^2+b^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^2,x)
```

```
[Out] 1/d/(a^2+b^2)/(a+b*cot(d*x+c))*A*b-1/d/(a^2+b^2)/(a+b*cot(d*x+c))*a*B-2/d/(
a^2+b^2)^2*ln(a+b*cot(d*x+c))*A*a*b+1/d/(a^2+b^2)^2*ln(a+b*cot(d*x+c))*a^2*
B-1/d/(a^2+b^2)^2*ln(a+b*cot(d*x+c))*b^2*B+1/d/(a^2+b^2)^2*ln(cot(d*x+c)^2+
1)*A*a*b-1/2/d/(a^2+b^2)^2*ln(cot(d*x+c)^2+1)*a^2*B+1/2/d/(a^2+b^2)^2*ln(co
t(d*x+c)^2+1)*b^2*B-1/2/d/(a^2+b^2)^2*A*Pi*a^2+1/2/d/(a^2+b^2)^2*A*Pi*b^2-1
/d/(a^2+b^2)^2*B*Pi*a*b+1/d/(a^2+b^2)^2*A*arccot(cot(d*x+c))*a^2-1/d/(a^2+b
^2)^2*A*arccot(cot(d*x+c))*b^2+2/d/(a^2+b^2)^2*B*arccot(cot(d*x+c))*a*b
```

maxima [A] time = 0.53, size = 185, normalized size = 1.67

$$\frac{\frac{2\left(Aa^2+2\,Bab-Ab^2\right)(dx+c)}{a^4+2\,a^2b^2+b^4}+\frac{2\left(Ba^2-2\,Aab-Bb^2\right)\log(a\tan(dx+c)+b)}{a^4+2\,a^2b^2+b^4}-\frac{\left(Ba^2-2\,Aab-Bb^2\right)\log\left(\tan(dx+c)^2+1\right)}{a^4+2\,a^2b^2+b^4}+\frac{2\left(Bab-Ab^2\right)}{a^3b+ab^3+\left(a^4+a^2b^2\right)\tan(dx+c)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(A*a^2 + 2*B*a*b - A*b^2)*(d*x + c)/(a^4 + 2*a^2*b^2 + b^4) + 2*(B*a
^2 - 2*A*a*b - B*b^2)*log(a*tan(d*x + c) + b)/(a^4 + 2*a^2*b^2 + b^4) - (B*
a^2 - 2*A*a*b - B*b^2)*log(tan(d*x + c)^2 + 1)/(a^4 + 2*a^2*b^2 + b^4) + 2*
(B*a*b - A*b^2)/(a^3*b + a*b^3 + (a^4 + a^2*b^2)*tan(d*x + c)))/d
```

mupad [B] time = 1.46, size = 268, normalized size = 2.41

$$\ln\left(a+b\cot\left(c+d\,x\right)\right)\left(\frac{B}{d\,\left(a^2+b^2\right)}-\frac{2\,B\,b^2}{d\,{\left(a^2+b^2\right)}^2}\right)+\frac{A\,\ln\left(\cot\left(c+d\,x\right)-\mathrm{i}\right)}{2\,\left(-1\mathrm{i}\,d\,a^2+2\,d\,a\,b+1\mathrm{i}\,d\,b^2\right)}-\frac{B\,\ln\left(\cot\left(c+d\,x\right)-\mathrm{i}\right)}{2\,\left(d\,a^2+2\mathrm{i}\,d\,a\,b-d\,b^2\right)}+\frac{}{(a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))/(a + b*cot(c + d*x))^2,x)
```

```
[Out] log(a + b*cot(c + d*x))*(B/(d*(a^2 + b^2)) - (2*B*b^2)/(d*(a^2 + b^2)^2)) +
 (A*log(cot(c + d*x) + 1i)*1i)/(2*(b^2*d - a^2*d + a*b*d*2i)) + (A*log(cot(
c + d*x) - 1i))/(2*(b^2*d*1i - a^2*d*1i + 2*a*b*d)) - (B*log(cot(c + d*x) -
 1i))/(2*(a^2*d - b^2*d + a*b*d*2i)) - (B*log(cot(c + d*x) + 1i)*1i)/(2*(a^
2*d*1i - b^2*d*1i + 2*a*b*d)) + (A*b)/((a*d + b*d*cot(c + d*x))*(a^2 + b^2)
) - (B*a)/((a*d + b*d*cot(c + d*x))*(a^2 + b^2)) - (2*A*a*b*log(a + b*cot(c
 + d*x)))/(d*(a^2 + b^2)^2)
```

sympy [A] time = 4.23, size = 3966, normalized size = 35.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))**2,x)
```

```
[Out] Piecewise((zoo*x*(A + B*cot(c))/cot(c)**2, Eq(a, 0) & Eq(b, 0) & Eq(d, 0)),
 ((-A*x + A*tan(c + d*x)/d + B*log(tan(c + d*x)**2 + 1)/(2*d))/b**2, Eq(a,
0)), (A*d*x*cot(c + d*x)**2/(-4*b**2*d*cot(c + d*x)**2 + 8*I*b**2*d*cot(c +
 d*x) + 4*b**2*d) - 2*I*A*d*x*cot(c + d*x)/(-4*b**2*d*cot(c + d*x)**2 + 8*I
*b**2*d*cot(c + d*x) + 4*b**2*d) - A*d*x/(-4*b**2*d*cot(c + d*x)**2 + 8*I*b
**2*d*cot(c + d*x) + 4*b**2*d) - A*cot(c + d*x)/(-4*b**2*d*cot(c + d*x)**2
+ 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) + 2*I*A/(-4*b**2*d*cot(c + d*x)**2 +
8*I*b**2*d*cot(c + d*x) + 4*b**2*d) - I*B*d*x*cot(c + d*x)**2/(-4*b**2*d*co
t(c + d*x)**2 + 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) - 2*B*d*x*cot(c + d*x)/
(-4*b**2*d*cot(c + d*x)**2 + 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) + I*B*d*x/
(-4*b**2*d*cot(c + d*x)**2 + 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) + I*B*cot(
c + d*x)/(-4*b**2*d*cot(c + d*x)**2 + 8*I*b**2*d*cot(c + d*x) + 4*b**2*d),
```

```
Eq(a, -I*b)), (A*d*x*cot(c + d*x)**2/(-4*b**2*d*cot(c + d*x)**2 - 8*I*b**2*
d*cot(c + d*x) + 4*b**2*d) + 2*I*A*d*x*cot(c + d*x)/(-4*b**2*d*cot(c + d*x)
**2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) - A*d*x/(-4*b**2*d*cot(c + d*x)**
2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) - A*cot(c + d*x)/(-4*b**2*d*cot(c +
 d*x)**2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) - 2*I*A/(-4*b**2*d*cot(c + d
*x)**2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) + I*B*d*x*cot(c + d*x)**2/(-4*
b**2*d*cot(c + d*x)**2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) - 2*B*d*x*cot(
c + d*x)/(-4*b**2*d*cot(c + d*x)**2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) -
 I*B*d*x/(-4*b**2*d*cot(c + d*x)**2 - 8*I*b**2*d*cot(c + d*x) + 4*b**2*d) -
 I*B*cot(c + d*x)/(-4*b**2*d*cot(c + d*x)**2 - 8*I*b**2*d*cot(c + d*x) + 4*
b**2*d), Eq(a, I*b)), (A*d*x*tan(c + d*x)**2*cot(c + d*x)**2/(8*b**2*d*tan(
c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*
d) + 3*A*d*x*tan(c + d*x)**2/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16
*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) + 4*A*d*x*tan(c + d*x)*cot(c
+ d*x)/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*c
ot(c + d*x) + 8*b**2*d) + 3*A*d*x*cot(c + d*x)**2/(8*b**2*d*tan(c + d*x)**2
*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) + A*d*x/
(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c +
d*x) + 8*b**2*d) + A*tan(c + d*x)*cot(c + d*x)**2/(8*b**2*d*tan(c + d*x)**2
*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) - 5*A*ta
n(c + d*x)/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*
x)*cot(c + d*x) + 8*b**2*d) - 4*A*cot(c + d*x)/(8*b**2*d*tan(c + d*x)**2*co
t(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) + 2*B*d*x*t
an(c + d*x)**2*cot(c + d*x)/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*
b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) + 2*B*d*x*tan(c + d*x)*cot(c +
 d*x)**2/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)
*cot(c + d*x) + 8*b**2*d) - 2*B*d*x*tan(c + d*x)/(8*b**2*d*tan(c + d*x)**2*
cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) - 2*B*d*x
*cot(c + d*x)/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c +
 d*x)*cot(c + d*x) + 8*b**2*d) + 3*B*tan(c + d*x)**2/(8*b**2*d*tan(c + d*x)
**2*cot(c + d*x)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d) + B*c
ot(c + d*x)**2/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x)**2 - 16*b**2*d*tan(c
+ d*x)*cot(c + d*x) + 8*b**2*d) + 2*B/(8*b**2*d*tan(c + d*x)**2*cot(c + d*x
)**2 - 16*b**2*d*tan(c + d*x)*cot(c + d*x) + 8*b**2*d), Eq(a, -b/tan(c + d*
x))), (x*(A + B*cot(c))/(a + b*cot(c))**2, Eq(d, 0)), (2*A*a**4*d*x*tan(c +
 d*x)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*
a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + 2*A*a**3*b*d*x/(2*
a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3
*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - 4*A*a**3*b*log(tan(c + d*x)
 + b/a)*tan(c + d*x)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*ta
n(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + 2*A
*a**3*b*log(tan(c + d*x)**2 + 1)*tan(c + d*x)/(2*a**6*d*tan(c + d*x) + 2*a*
*5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c +
 d*x) + 2*a*b**5*d) - 2*A*a**2*b**2*d*x*tan(c + d*x)/(2*a**6*d*tan(c + d*x)
 + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*
```

```
tan(c + d*x) + 2*a*b**5*d) - 4*A*a**2*b**2*log(tan(c + d*x) + b/a)/(2*a**6*
d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d +
2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + 2*A*a**2*b**2*log(tan(c + d*x)**
2 + 1)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4
*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - 2*A*a**2*b**2/(2*
a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3
*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - 2*A*a*b**3*d*x/(2*a**6*d*ta
n(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a*
*2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - 2*A*b**4/(2*a**6*d*tan(c + d*x) + 2*
a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c
 + d*x) + 2*a*b**5*d) + 2*B*a**4*log(tan(c + d*x) + b/a)*tan(c + d*x)/(2*a*
*6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d
 + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - B*a**4*log(tan(c + d*x)**2 +
1)*tan(c + d*x)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c +
 d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + 4*B*a**3
*b*d*x*tan(c + d*x)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan
(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + 2*B*
a**3*b*log(tan(c + d*x) + b/a)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4
*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**
5*d) - B*a**3*b*log(tan(c + d*x)**2 + 1)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*
d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x)
 + 2*a*b**5*d) + 2*B*a**3*b/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b*
*2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d
) + 4*B*a**2*b**2*d*x/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*t
an(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - 2*
B*a**2*b**2*log(tan(c + d*x) + b/a)*tan(c + d*x)/(2*a**6*d*tan(c + d*x) + 2
*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(
c + d*x) + 2*a*b**5*d) + B*a**2*b**2*log(tan(c + d*x)**2 + 1)*tan(c + d*x)/
(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) + 4*a**3*b
**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) - 2*B*a*b**3*log(tan(c + d
*x) + b/a)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x)
 + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + B*a*b**3*log(
tan(c + d*x)**2 + 1)/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*ta
n(c + d*x) + 4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d) + 2*B
*a*b**3/(2*a**6*d*tan(c + d*x) + 2*a**5*b*d + 4*a**4*b**2*d*tan(c + d*x) +
4*a**3*b**3*d + 2*a**2*b**4*d*tan(c + d*x) + 2*a*b**5*d), True))
```

3.94 $\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^3}\,dx$

Optimal. Leaf size=175

$$\frac{Ab-aB}{2d\left(a^2+b^2\right)(a+b\cot(c+dx))^2}+\frac{a^2(-B)+2aAb+b^2B}{d\left(a^2+b^2\right)^2(a+b\cot(c+dx))}-\frac{\left(a^3(-B)+3a^2Ab+3ab^2B-Ab^3\right)\log(a\sin(}{d\left(a^2+b^2\right)^3}$$

```
[Out] (A*a^3-3*A*a*b^2+3*B*a^2*b-B*b^3)*x/(a^2+b^2)^3+1/2*(A*b-B*a)/(a^2+b^2)/d/(
a+b*cot(d*x+c))^2+(2*A*a*b-B*a^2+B*b^2)/(a^2+b^2)^2/d/(a+b*cot(d*x+c))-(3*A
*a^2*b-A*b^3-B*a^3+3*B*a*b^2)*ln(b*cos(d*x+c)+a*sin(d*x+c))/(a^2+b^2)^3/d
```

Rubi [A] time = 0.28, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3529, 3531, 3530}

$$\frac{Ab-aB}{2d\left(a^2+b^2\right)(a+b\cot(c+dx))^2}+\frac{a^2(-B)+2aAb+b^2B}{d\left(a^2+b^2\right)^2(a+b\cot(c+dx))}-\frac{\left(3a^2Ab+a^3(-B)+3ab^2B-Ab^3\right)\log(a\sin(}{d\left(a^2+b^2\right)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] ((a^3*A - 3*a*A*b^2 + 3*a^2*b*B - b^3*B)*x)/(a^2 + b^2)^3 + (A*b - a*B)/(2*
(a^2 + b^2)*d*(a + b*Cot[c + d*x])^2) + (2*a*A*b - a^2*B + b^2*B)/((a^2 + b
^2)^2*d*(a + b*Cot[c + d*x])) - ((3*a^2*A*b - A*b^3 - a^3*B + 3*a*b^2*B)*Lo
g[b*Cos[c + d*x] + a*Sin[c + d*x]])/((a^2 + b^2)^3*d)
```

Rule 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3530

```
Int[((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])/((a_) + (b_.)*tan[(e_.) + (f_.)*
(x_)]), x_Symbol] :> Simp[(c*Log[RemoveContent[a*Cos[e + f*x] + b*Sin[e + f
*x], x]])/(b*f), x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] &&
 NeQ[a^2 + b^2, 0] && EqQ[a*c + b*d, 0]
```

Rule 3531

```
Int[((c_.) + (d_.)*tan[(e_.) + (f_.)*(x_)])/((a_.) + (b_.)*tan[(e_.) + (f_.
)*(x_)]), x_Symbol] :> Simp[((a*c + b*d)*x)/(a^2 + b^2), x] + Dist[(b*c - a
*d)/(a^2 + b^2), Int[(b - a*Tan[e + f*x])/(a + b*Tan[e + f*x]), x], x] /; F
reeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && Ne
Q[a*c + b*d, 0]
```

Rubi steps

$$\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^3}\,dx = \frac{Ab-aB}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{\int \frac{aA+bB-(Ab-aB)\cot(c+dx)}{(a+b\cot(c+dx))^2}\,dx}{a^2+b^2}$$

$$= \frac{Ab-aB}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{2aAb-a^2B+b^2B}{\left(a^2+b^2\right)^2 d(a+b\cot(c+dx))} + \int \frac{a^2A-Ab^2+2abB-}{a}$$

$$= \frac{\left(a^3A-3aAb^2+3a^2bB-b^3B\right)x}{\left(a^2+b^2\right)^3} + \frac{Ab-aB}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{2aAb-}{\left(a^2+b^2\right)^2 d(}$$

$$= \frac{\left(a^3A-3aAb^2+3a^2bB-b^3B\right)x}{\left(a^2+b^2\right)^3} + \frac{Ab-aB}{2\left(a^2+b^2\right)d(a+b\cot(c+dx))^2} + \frac{2aAb-}{\left(a^2+b^2\right)^2 d(}$$

Mathematica [C] time = 5.00, size = 202, normalized size = 1.15

$$\frac{\frac{2\left(a^3B-3a^2Ab-3ab^2B+Ab^3\right)\log(a\tan(c+dx)+b)-\frac{b\left(a^2+b^2\right)\left(\left(-4a^4B+6a^3Ab+2aAb^3\right)\tan(c+dx)+b\left(-3a^3B+5a^2Ab+ab^2B+Ab^3\right)\right)}{a^2(a\tan(c+dx)+b)^2}}{\left(a^2+b^2\right)^3} - \frac{i(A-iB)\log(-\tan(c+dx)+i)}{(a-ib)^3} +}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^3,x]
```

```
[Out] (((-I)*(A - I*B)*Log[I - Tan[c + d*x]])/(a - I*b)^3 + (I*(A + I*B)*Log[I +
Tan[c + d*x]])/(a + I*b)^3 + (2*(-3*a^2*A*b + A*b^3 + a^3*B - 3*a*b^2*B)*Lo
g[b + a*Tan[c + d*x]] - (b*(a^2 + b^2)*(b*(5*a^2*A*b + A*b^3 - 3*a^3*B + a*
b^2*B) + (6*a^3*A*b + 2*a*A*b^3 - 4*a^4*B)*Tan[c + d*x]))/(a^2*(b + a*Tan[c
 + d*x])^2))/(a^2 + b^2)^3)/(2*d)
```

fricas [B] time = 0.71, size = 549, normalized size = 3.14

$$\frac{2\,Ba^3b^2-2\,Aa^2b^3+2\,Bab^4-2\,Ab^5-2\left(Aa^5+3\,Ba^4b-2\,Aa^3b^2+2\,Ba^2b^3-3\,Aab^4-Bb^5\right)dx-2\left(4\,Ba^3b^2-6\,\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/2*(2*B*a^3*b^2 - 2*A*a^2*b^3 + 2*B*a*b^4 - 2*A*b^5 - 2*(A*a^5 + 3*B*a^4*b
 - 2*A*a^3*b^2 + 2*B*a^2*b^3 - 3*A*a*b^4 - B*b^5)*d*x - 2*(4*B*a^3*b^2 - 6*
A*a^2*b^3 - 2*B*a*b^4 - (A*a^5 + 3*B*a^4*b - 4*A*a^3*b^2 - 4*B*a^2*b^3 + 3*
A*a*b^4 + B*b^5)*d*x)*cos(2*d*x + 2*c) - (B*a^5 - 3*A*a^4*b - 2*B*a^3*b^2 -
 2*A*a^2*b^3 - 3*B*a*b^4 + A*b^5 - (B*a^5 - 3*A*a^4*b - 4*B*a^3*b^2 + 4*A*a
^2*b^3 + 3*B*a*b^4 - A*b^5)*cos(2*d*x + 2*c) + 2*(B*a^4*b - 3*A*a^3*b^2 - 3
*B*a^2*b^3 + A*a*b^4)*sin(2*d*x + 2*c))*log(a*b*sin(2*d*x + 2*c) + 1/2*a^2
+ 1/2*b^2 - 1/2*(a^2 - b^2)*cos(2*d*x + 2*c)) - 2*(2*B*a^4*b - 3*A*a^3*b^2
- 3*B*a^2*b^3 + 3*A*a*b^4 + B*b^5 + 2*(A*a^4*b + 3*B*a^3*b^2 - 3*A*a^2*b^3
- B*a*b^4)*d*x)*sin(2*d*x + 2*c))/((a^8 + 2*a^6*b^2 - 2*a^2*b^6 - b^8)*d*co
s(2*d*x + 2*c) - 2*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^7)*d*sin(2*d*x + 2*
c) - (a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*d)
```

giac [B] time = 0.49, size = 412, normalized size = 2.35

$$\frac{2\left(Aa^{3}+3\,Ba^{2}b-3\,Aab^{2}-Bb^{3}\right)(dx+c)}{a^{6}+3\,a^{4}b^{2}+3\,a^{2}b^{4}+b^{6}}-\frac{\left(Ba^{3}-3\,Aa^{2}b-3\,Bab^{2}+Ab^{3}\right)\log\left(\tan(dx+c)^{2}+1\right)}{a^{6}+3\,a^{4}b^{2}+3\,a^{2}b^{4}+b^{6}}+\frac{2\left(Ba^{4}-3\,Aa^{3}b-3\,Ba^{2}b^{2}+Aab^{3}\right)\log(|a\tan(dx+c)+b|)}{a^{7}+3\,a^{5}b^{2}+3\,a^{3}b^{4}+ab^{6}}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*(A*a^3 + 3*B*a^2*b - 3*A*a*b^2 - B*b^3)*(d*x + c)/(a^6 + 3*a^4*b^2 +
 3*a^2*b^4 + b^6) - (B*a^3 - 3*A*a^2*b - 3*B*a*b^2 + A*b^3)*log(tan(d*x + c
)^2 + 1)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + 2*(B*a^4 - 3*A*a^3*b - 3*B*a
^2*b^2 + A*a*b^3)*log(abs(a*tan(d*x + c) + b))/(a^7 + 3*a^5*b^2 + 3*a^3*b^4
 + a*b^6) - (3*B*a^7*tan(d*x + c)^2 - 9*A*a^6*b*tan(d*x + c)^2 - 9*B*a^5*b^
2*tan(d*x + c)^2 + 3*A*a^4*b^3*tan(d*x + c)^2 + 2*B*a^6*b*tan(d*x + c) - 12
*A*a^5*b^2*tan(d*x + c) - 22*B*a^4*b^3*tan(d*x + c) + 14*A*a^3*b^4*tan(d*x
+ c) + 2*A*a*b^6*tan(d*x + c) - 4*A*a^4*b^3 - 11*B*a^3*b^4 + 9*A*a^2*b^5 +
B*a*b^6 + A*b^7)/((a^8 + 3*a^6*b^2 + 3*a^4*b^4 + a^2*b^6)*(a*tan(d*x + c) +
 b)^2))/d
```

maple [B] time = 0.38, size = 559, normalized size = 3.19

$$\frac{Ab}{2d\left(a^{2}+b^{2}\right)\left(a+b\cot\left(dx+c\right)\right)^{2}}-\frac{aB}{2d\left(a^{2}+b^{2}\right)\left(a+b\cot\left(dx+c\right)\right)^{2}}+\frac{2Aab}{d\left(a^{2}+b^{2}\right)^{2}\left(a+b\cot\left(dx+c\right)\right)}-\frac{}{d\left(a^{2}+b^{2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^3,x)
```

```
[Out] 1/2/d/(a^2+b^2)/(a+b*cot(d*x+c))^2*A*b-1/2/d/(a^2+b^2)/(a+b*cot(d*x+c))^2*a
*B+2/d/(a^2+b^2)^2/(a+b*cot(d*x+c))*A*a*b-1/d/(a^2+b^2)^2/(a+b*cot(d*x+c))*
a^2*B+1/d/(a^2+b^2)^2/(a+b*cot(d*x+c))*b^2*B-3/d/(a^2+b^2)^3*ln(a+b*cot(d*x
+c))*A*a^2*b+1/d/(a^2+b^2)^3*ln(a+b*cot(d*x+c))*A*b^3+1/d/(a^2+b^2)^3*ln(a+
b*cot(d*x+c))*a^3*B-3/d/(a^2+b^2)^3*ln(a+b*cot(d*x+c))*B*a*b^2+3/2/d/(a^2+b
^2)^3*ln(cot(d*x+c)^2+1)*A*a^2*b-1/2/d/(a^2+b^2)^3*ln(cot(d*x+c)^2+1)*A*b^3
-1/2/d/(a^2+b^2)^3*ln(cot(d*x+c)^2+1)*a^3*B+3/2/d/(a^2+b^2)^3*ln(cot(d*x+c)
^2+1)*B*a*b^2-1/2/d/(a^2+b^2)^3*A*Pi*a^3+3/2/d/(a^2+b^2)^3*A*Pi*a*b^2-3/2/d
/(a^2+b^2)^3*B*Pi*a^2*b+1/2/d/(a^2+b^2)^3*B*Pi*b^3+1/d/(a^2+b^2)^3*A*arccot
(cot(d*x+c))*a^3-3/d/(a^2+b^2)^3*A*arccot(cot(d*x+c))*a*b^2+3/d/(a^2+b^2)^3
*B*arccot(cot(d*x+c))*a^2*b-1/d/(a^2+b^2)^3*B*arccot(cot(d*x+c))*b^3
```

maxima [A] time = 0.87, size = 337, normalized size = 1.93

$$\frac{\frac{2\left(Aa^3+3\,Ba^2b-3\,Aab^2-Bb^3\right)(dx+c)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{2\left(Ba^3-3\,Aa^2b-3\,Bab^2+Ab^3\right)\log(a\tan(dx+c)+b)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}-\frac{\left(Ba^3-3\,Aa^2b-3\,Bab^2+Ab^3\right)\log\left(\tan(dx+c)^2+1\right)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{\cdots}{a^6b^2\cdots}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(A*a^3 + 3*B*a^2*b - 3*A*a*b^2 - B*b^3)*(d*x + c)/(a^6 + 3*a^4*b^2 +
 3*a^2*b^4 + b^6) + 2*(B*a^3 - 3*A*a^2*b - 3*B*a*b^2 + A*b^3)*log(a*tan(d*x
 + c) + b)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) - (B*a^3 - 3*A*a^2*b - 3*B*a
*b^2 + A*b^3)*log(tan(d*x + c)^2 + 1)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) +
 (3*B*a^3*b^2 - 5*A*a^2*b^3 - B*a*b^4 - A*b^5 + 2*(2*B*a^4*b - 3*A*a^3*b^2
- A*a*b^4)*tan(d*x + c))/(a^6*b^2 + 2*a^4*b^4 + a^2*b^6 + (a^8 + 2*a^6*b^2
+ a^4*b^4)*tan(d*x + c)^2 + 2*(a^7*b + 2*a^5*b^3 + a^3*b^5)*tan(d*x + c)))/
d
```

mupad [B] time = 2.60, size = 481, normalized size = 2.75

$$\frac{\frac{5\,A\,a^2\,b+A\,b^3}{2\,\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{2\,A\,a\,b^2\,\cot(c+d\,x)}{a^4+2\,a^2\,b^2+b^4}}{d\,a^2+2\,d\,a\,b\,\cot\left(c+d\,x\right)+d\,b^2\,{\cot\left(c+d\,x\right)}^2}-\ln\left(a+b\,\cot\left(c+d\,x\right)\right)\,\left(\frac{3\,A\,b}{d\,{\left(a^2+b^2\right)}^2}-\frac{4\,A\,b^3}{d\,{\left(a^2+b^2\right)}^3}\right)-\frac{\frac{3\,B\,a^3\cdots}{2\,\left(a^4+2\,\cdots\right.}}{d\,a^2+2\,d\,a\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))/(a + b*cot(c + d*x))^3,x)
```

```
[Out] ((A*b^3 + 5*A*a^2*b)/(2*(a^4 + b^4 + 2*a^2*b^2)) + (2*A*a*b^2*cot(c + d*x))
/(a^4 + b^4 + 2*a^2*b^2))/(a^2*d + b^2*d*cot(c + d*x)^2 + 2*a*b*d*cot(c + d
*x)) - log(a + b*cot(c + d*x))*((3*A*b)/(d*(a^2 + b^2)^2) - (4*A*b^3)/(d*(a
^2 + b^2)^3)) - ((3*B*a^3 - B*a*b^2)/(2*(a^4 + b^4 + 2*a^2*b^2)) - (cot(c +
 d*x)*(B*b^3 - B*a^2*b))/(a^4 + b^4 + 2*a^2*b^2))/(a^2*d + b^2*d*cot(c + d*
```

```
x)^2 + 2*a*b*d*cot(c + d*x)) + log(a + b*cot(c + d*x))*((B*a)/(d*(a^2 + b^2
)^2) - (4*B*a*b^2)/(d*(a^2 + b^2)^3)) + (A*log(cot(c + d*x) - 1i)*1i)/(2*(a
^3*d - b^3*d*1i - 3*a*b^2*d + a^2*b*d*3i)) + (A*log(cot(c + d*x) + 1i))/(2*
(a^3*d*1i - b^3*d - a*b^2*d*3i + 3*a^2*b*d)) - (B*log(cot(c + d*x) - 1i)*1i
)/(2*(a^3*d*1i + b^3*d - a*b^2*d*3i - 3*a^2*b*d)) - (B*log(cot(c + d*x) + 1
i))/(2*(a^3*d + b^3*d*1i - 3*a*b^2*d - a^2*b*d*3i))
```

sympy [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: AttributeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))**3,x)
```

```
[Out] Exception raised: AttributeError
```

3.95 $\int (a+b\cot(c+dx))^{5/2}(A+B\cot(c+dx))\,dx$

Optimal. Leaf size=188

$$-\frac{2\left(a^2B+2aAb-b^2B\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2(aB+Ab)(a+b\cot(c+dx))^{3/2}}{3d}+\frac{(a-ib)^{5/2}(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\,c}}{\sqrt{a}}\right.}{d}$$

```
[Out] (a-I*b)^(5/2)*(I*A+B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/d-(a+I*
b)^(5/2)*(I*A-B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/d-2/3*(A*b+B
*a)*(a+b*cot(d*x+c))^(3/2)/d-2/5*B*(a+b*cot(d*x+c))^(5/2)/d-2*(2*A*a*b+B*a^
2-B*b^2)*(a+b*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.45, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {3528, 3539, 3537, 63, 208}

$$-\frac{2\left(a^2B+2aAb-b^2B\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2(aB+Ab)(a+b\cot(c+dx))^{3/2}}{3d}+\frac{(a-ib)^{5/2}(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\,c}}{\sqrt{a}}\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^(5/2)*(A + B*Cot[c + d*x]),x]
```

```
[Out] ((a - I*b)^(5/2)*(I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])
/d - ((a + I*b)^(5/2)*(I*A - B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I
*b]])/d - (2*(2*a*A*b + a^2*B - b^2*B)*Sqrt[a + b*Cot[c + d*x]])/d - (2*(A*
b + a*B)*(a + b*Cot[c + d*x])^(3/2))/(3*d) - (2*B*(a + b*Cot[c + d*x])^(5/2
))/(5*d)
```

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]
```

Rule 3528

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

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int (a+b\cot(c+dx))^{5/2}(A+B\cot(c+dx))\,dx = -\frac{2B(a+b\cot(c+dx))^{5/2}}{5d}+\int (a+b\cot(c+dx))^{3/2}(aA-bB+$$

$$= -\frac{2(Ab+aB)(a+b\cot(c+dx))^{3/2}}{3d}-\frac{2B(a+b\cot(c+dx))^{5/2}}{5d}+$$

$$= -\frac{2\left(2aAb+a^2B-b^2B\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2(Ab+aB)(a+}{3}$$

$$= -\frac{2\left(2aAb+a^2B-b^2B\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2(Ab+aB)(a+}{3}$$

$$= -\frac{2\left(2aAb+a^2B-b^2B\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2(Ab+aB)(a+}{3}$$

$$= -\frac{2\left(2aAb+a^2B-b^2B\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2(Ab+aB)(a+}{3}$$

$$= \frac{(a-ib)^{5/2}(iA+B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{(a+ib)^{5/2}(iA-B)}{}$$

Mathematica [B] time = 1.80, size = 379, normalized size = 2.02

$$-\frac{2\left(\left(a^2B+2aAb-b^2B\right)\sqrt{a+b\cot(c+dx)}+\frac{\sqrt{a-\sqrt{-b^2}}\left(a^3\left(Ab-\sqrt{-b^2}\,B\right)-3a^2b\left(A\sqrt{-b^2}+bB\right)+3ab^2\left(\sqrt{-b^2}\,B-Ab\right)+b^3\left(A\sqrt{-b^2}+bB\right)\right.}{2\left(a\sqrt{-b^2}+b^2\right)}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^(5/2)*(A + B*Cot[c + d*x]),x]
```

```
[Out] (-2*((Sqrt[a - Sqrt[-b^2]]*(-3*a^2*b*(A*Sqrt[-b^2] + b*B) + b^3*(A*Sqrt[-b^
2] + b*B) + a^3*(A*b - Sqrt[-b^2]*B) + 3*a*b^2*(-(A*b) + Sqrt[-b^2]*B))*Arc
Tanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - Sqrt[-b^2]]])/(2*(b^2 + a*Sqrt[-b^2]
)) + ((b^3*(A*Sqrt[-b^2] - b*B) + 3*a^2*b*(-(A*Sqrt[-b^2]) + b*B) - a^3*(A*
b + Sqrt[-b^2]*B) + 3*a*b^2*(A*b + Sqrt[-b^2]*B))*ArcTanh[Sqrt[a + b*Cot[c
+ d*x]]/Sqrt[a + Sqrt[-b^2]]])/(2*Sqrt[-b^2]*Sqrt[a + Sqrt[-b^2]]) + (2*a*A
*b + a^2*B - b^2*B)*Sqrt[a + b*Cot[c + d*x]] + ((A*b + a*B)*(a + b*Cot[c +
d*x])^(3/2))/3 + (B*(a + b*Cot[c + d*x])^(5/2))/5))/d
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(5/2)*(A+B*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (B\cot(dx+c)+A)(b\cot(dx+c)+a)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(5/2)*(A+B*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((B*cot(d*x + c) + A)*(b*cot(d*x + c) + a)^(5/2), x)
```

maple [B] time = 0.55, size = 2405, normalized size = 12.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^(5/2)*(A+B*cot(d*x+c)),x)

[Out] 3/4/d*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2
)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2+1/d*b^2/(2*(a^2+b^2)
^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^
(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*(a^2+b^2)^(1/2)-3/d*b^2/(2*(a^2+b^2
)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))
^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a+1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2
)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b
^2)^(1/2)-2*a)^(1/2))*B*(a^2+b^2)^(1/2)*a^2-1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/
2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+
b^2)^(1/2)-2*a)^(1/2))*B*(a^2+b^2)^(1/2)*a^2+1/2/d*ln((a+b*cot(d*x+c))^(1/2
)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2)*a+3/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*
arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2
)^(1/2)-2*a)^(1/2))*A*a^2-2/3/d*B*(a+b*cot(d*x+c))^(3/2)*a-2/d*B*a^2*(a+b*c
ot(d*x+c))^(1/2)+2/d*B*(a+b*cot(d*x+c))^(1/2)*b^2-2/3/d*A*(a+b*cot(d*x+c))^
(3/2)*b-1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+
(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^3-4/d*A*(
a+b*cot(d*x+c))^(1/2)*a*b+1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*
(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)*(a^2+b^2)^(1/2)*a^2-1/4/d/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2
)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2
)*(a^2+b^2)^(1/2)*a^2-2/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b
^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2
))*A*(a^2+b^2)^(1/2)*a+2/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*c
ot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/
2))*A*(a^2+b^2)^(1/2)*a-3/4/d*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+
2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*
a^2+1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)
-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^3+1/d*b^3/(2*
(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1
/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A-1/d*b^3/(2*(a^2+b^2)^(1/2)
-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))
/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A+1/4/d*b^2*ln((a+b*cot(d*x+c))^(1/2)*(2*(a
^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/
2)+2*a)^(1/2)-1/4/d*b^2*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^
2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-3/4/d*
b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a
^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-1/2/d*ln(b*cot(d*x+c)+a+(a
+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*B*(2*(a
^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2)*a-1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*c
ot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)*a^3-1/4/d*b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(
2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/
```

```
2)*(a^2+b^2)^(1/2)-3/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d
*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*
A*a^2-1/d*b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2
)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*(a^2+b^2)
^(1/2)+3/d*b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/
2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a+3/4/d*
b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a
^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a+1/4/d*b*ln((a+b*cot(d*x+c)
)^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*
(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2)+1/4/d/b*ln((a+b*cot(d*x+c))^(1/2
)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)*a^3-2/5*B*(a+b*cot(d*x+c))^(5/2)/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (B\cot(dx+c)+A)(b\cot(dx+c)+a)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(5/2)*(A+B*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((B*cot(d*x + c) + A)*(b*cot(d*x + c) + a)^(5/2), x)
```

mupad [B] time = 31.59, size = 3864, normalized size = 20.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))*(a + b*cot(c + d*x))^(5/2),x)
```

```
[Out] log((8*B^3*a*b^2*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3 - ((((((-B^4*b^2*d^4*(5*a
^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + B^2*a^5*d^2 - 10*B^2*a^3*b^2*d^2 + 5*B^2*
a*b^4*d^2)/d^4)^(1/2)*(32*B*a^4*b^2 - 32*B*b^6 + 32*a*b^2*d*(((-B^4*b^2*d^4
*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + B^2*a^5*d^2 - 10*B^2*a^3*b^2*d^2 + 5
*B^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) - (16*B^2*b^2
*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2)*(((
-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + B^2*a^5*d^2 - 10*B^2*a^3
*b^2*d^2 + 5*B^2*a*b^4*d^2)/d^4)^(1/2))/2)*((20*B^4*a^2*b^8*d^4 - B^4*b^10*
d^4 - 110*B^4*a^4*b^6*d^4 + 100*B^4*a^6*b^4*d^4 - 25*B^4*a^8*b^2*d^4)^(1/2)
/(4*d^4) + (B^2*a^5)/(4*d^2) - (5*B^2*a^3*b^2)/(2*d^2) + (5*B^2*a*b^4)/(4*d
^2))^(1/2) - log(((((((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + B
^2*a^5*d^2 - 10*B^2*a^3*b^2*d^2 + 5*B^2*a*b^4*d^2)/d^4)^(1/2)*(32*B*b^6 - 3
2*B*a^4*b^2 + 32*a*b^2*d*(((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2
) + B^2*a^5*d^2 - 10*B^2*a^3*b^2*d^2 + 5*B^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*c
ot(c + d*x))^(1/2)))/(2*d) - (16*B^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 -
```

b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2)*(((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + B^2*a^5*d^2 - 10*B^2*a^3*b^2*d^2 + 5*B^2*a*b^4*d^2)/d^4)^(1/2))/2 + (8*B^3*a*b^2*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3)*(((20*B^4*a^2*b^8*d^4 - B^4*b^10*d^4 - 110*B^4*a^4*b^6*d^4 + 100*B^4*a^6*b^4*d^4 - 25*B^4*a^8*b^2*d^4)^(1/2) + B^2*a^5*d^2 - 10*B^2*a^3*b^2*d^2 + 5*B^2*a*b^4*d^2)/(4*d^4))^(1/2) - log(((((-((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/d^4)^(1/2)*(32*B*b^6 - 32*B*a^4*b^2 + 32*a*b^2*d*(-((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) - (16*B^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2)*(-((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/d^4)^(1/2))/2 + (8*B^3*a*b^2*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3)*(-((20*B^4*a^2*b^8*d^4 - B^4*b^10*d^4 - 110*B^4*a^4*b^6*d^4 + 100*B^4*a^6*b^4*d^4 - 25*B^4*a^8*b^2*d^4)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/(4*d^4))^(1/2) + log((8*B^3*a*b^2*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3 - ((((-((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/d^4)^(1/2)*(32*B*a^4*b^2 - 32*B*b^6 + 32*a*b^2*d*(-((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) - (16*B^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2)*(-((-B^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - B^2*a^5*d^2 + 10*B^2*a^3*b^2*d^2 - 5*B^2*a*b^4*d^2)/d^4)^(1/2))/2)*((B^2*a^5)/(4*d^2) - (20*B^4*a^2*b^8*d^4 - B^4*b^10*d^4 - 110*B^4*a^4*b^6*d^4 + 100*B^4*a^6*b^4*d^4 - 25*B^4*a^8*b^2*d^4)^(1/2)/(4*d^4) - (5*B^2*a^3*b^2)/(2*d^2) + (5*B^2*a*b^4)/(4*d^2))^(1/2) - ((4*B*a^2)/d - (2*B*(a^2 + b^2))/d)*(a + b*cot(c + d*x))^(1/2) - log((8*A^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)/d^3 - ((-((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + A^2*a^5*d^2 - 10*A^2*a^3*b^2*d^2 + 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(((-((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + A^2*a^5*d^2 - 10*A^2*a^3*b^2*d^2 + 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(64*A*a^3*b^3 + 64*A*a*b^5 - 32*a*b^2*d*(-((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + A^2*a^5*d^2 - 10*A^2*a^3*b^2*d^2 + 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) - (16*A^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/2)*(-((20*A^4*a^2*b^8*d^4 - A^4*b^10*d^4 - 110*A^4*a^4*b^6*d^4 + 100*A^4*a^6*b^4*d^4 - 25*A^4*a^8*b^2*d^4)^(1/2) + A^2*a^5*d^2 - 10*A^2*a^3*b^2*d^2 + 5*A^2*a*b^4*d^2)/(4*d^4))^(1/2) - log((8*A^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)/d^3 - ((((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b^2*d^2 - 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(((((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b^2*d^2 - 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(64*A*a^3*b^3 + 64*A*a*b^5 - 32*a*b^2*d*(((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b^2*d^2 - 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) - (16*A^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/2)*(((20*A^4*a^2*b^8*d^4 - A^4*b^10*d^4 - 110*A^4*a^4*b^6*d^4 + 100*A^4*a^6*b^4*d^4 - 25*

```
A^4*a^8*b^2*d^4)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b^2*d^2 - 5*A^2*a*b^4*d^2
)/(4*d^4))^(1/2) + log((8*A^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)/d^3 - ((((-A
^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b
^2*d^2 - 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(((((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^
2*b^2)^2)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b^2*d^2 - 5*A^2*a*b^4*d^2)/d^4)^
(1/2)*(64*A*a^3*b^3 + 64*A*a*b^5 + 32*a*b^2*d*(((-A^4*b^2*d^4*(5*a^4 + b^4
- 10*a^2*b^2)^2)^(1/2) - A^2*a^5*d^2 + 10*A^2*a^3*b^2*d^2 - 5*A^2*a*b^4*d^2
)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) + (16*A^2*b^2*(a + b*cot(c
+ d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/2)*((20*A^4*a^2*
b^8*d^4 - A^4*b^10*d^4 - 110*A^4*a^4*b^6*d^4 + 100*A^4*a^6*b^4*d^4 - 25*A^4
*a^8*b^2*d^4)^(1/2)/(4*d^4) - (A^2*a^5)/(4*d^2) + (5*A^2*a^3*b^2)/(2*d^2) -
 (5*A^2*a*b^4)/(4*d^2))^(1/2) + log((8*A^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)
/d^3 - ((-((-A^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + A^2*a^5*d^2
- 10*A^2*a^3*b^2*d^2 + 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(((-((-A^4*b^2*d^4*(5*a^
4 + b^4 - 10*a^2*b^2)^2)^(1/2) + A^2*a^5*d^2 - 10*A^2*a^3*b^2*d^2 + 5*A^2*a
*b^4*d^2)/d^4)^(1/2)*(64*A*a^3*b^3 + 64*A*a*b^5 + 32*a*b^2*d*(-((-A^4*b^2*d
^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + A^2*a^5*d^2 - 10*A^2*a^3*b^2*d^2 +
 5*A^2*a*b^4*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) + (16*A^2*b
^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/
2)*((5*A^2*a^3*b^2)/(2*d^2) - (A^2*a^5)/(4*d^2) - (20*A^4*a^2*b^8*d^4 - A^4
*b^10*d^4 - 110*A^4*a^4*b^6*d^4 + 100*A^4*a^6*b^4*d^4 - 25*A^4*a^8*b^2*d^4)
^(1/2)/(4*d^4) - (5*A^2*a*b^4)/(4*d^2))^(1/2) - (2*B*(a + b*cot(c + d*x))^(
5/2))/(5*d) - (2*A*b*(a + b*cot(c + d*x))^(3/2))/(3*d) - (2*B*a*(a + b*cot(
c + d*x))^(3/2))/(3*d) - (4*A*a*b*(a + b*cot(c + d*x))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (A + B\cot(c + dx))(a + b\cot(c + dx))^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**(5/2)*(A+B*cot(d*x+c)),x)
```

```
[Out] Integral((A + B*cot(c + d*x))*(a + b*cot(c + d*x))**(5/2), x)
```

3.96 $\int (a+b\cot(c+dx))^{3/2}(A+B\cot(c+dx))\,dx$

Optimal. Leaf size=150

$$-\frac{2(aB+Ab)\sqrt{a+b\cot(c+dx)}}{d}+\frac{(a-ib)^{3/2}(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{(a+ib)^{3/2}(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b}}{\sqrt{}}\right.}{d}$$

```
[Out] (a-I*b)^(3/2)*(I*A+B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/d-(a+I*
b)^(3/2)*(I*A-B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/d-2/3*B*(a+b
*cot(d*x+c))^(3/2)/d-2*(A*b+B*a)*(a+b*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.33, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3528, 3539, 3537, 63, 208}

$$-\frac{2(aB+Ab)\sqrt{a+b\cot(c+dx)}}{d}+\frac{(a-ib)^{3/2}(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{(a+ib)^{3/2}(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b}}{\sqrt{}}\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cot[c + d*x])^(3/2)*(A + B*Cot[c + d*x]),x]
```

```
[Out] ((a - I*b)^(3/2)*(I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])
/d - ((a + I*b)^(3/2)*(I*A - B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I
*b]])/d - (2*(A*b + a*B)*Sqrt[a + b*Cot[c + d*x]])/d - (2*B*(a + b*Cot[c +
d*x])^(3/2))/(3*d)
```

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]
```

Rule 3528

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[(d*(a + b*Tan[e + f*x])^m)/(f*m), x] + Int
[(a + b*Tan[e + f*x])^(m - 1)*Simp[a*c - b*d + (b*c + a*d)*Tan[e + f*x], x]
```

```
, x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
 0] && GtQ[m, 0]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int (a+b\cot(c+dx))^{3/2}(A+B\cot(c+dx))\,dx = -\frac{2B(a+b\cot(c+dx))^{3/2}}{3d}+\int \sqrt{a+b\cot(c+dx)}\,(aA-bB+(A$$

$$= -\frac{2(Ab+aB)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2B(a+b\cot(c+dx))^{3/2}}{3d}+\int$$

$$= -\frac{2(Ab+aB)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2B(a+b\cot(c+dx))^{3/2}}{3d}+\frac{1}{2}$$

$$= -\frac{2(Ab+aB)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2B(a+b\cot(c+dx))^{3/2}}{3d}+\frac{((}{}$$

$$= -\frac{2(Ab+aB)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2B(a+b\cot(c+dx))^{3/2}}{3d}+\frac{((}{}$$

$$= \frac{(a-ib)^{3/2}(iA+B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{(a+ib)^{3/2}(iA-B)\,\mathrm{t}}{}$$

Mathematica [A] time = 0.97, size = 294, normalized size = 1.96

$$-\frac{\frac{3\sqrt{a-\sqrt{-b^2}}\left(a^2\left(Ab-\sqrt{-b^2}B\right)-2ab\left(A\sqrt{-b^2}+bB\right)+b^2\left(\sqrt{-b^2}B-Ab\right)\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{-b^2}}}\right)}{a\sqrt{-b^2}+b^2}+\frac{3\left(-\left(a^2\left(Ab+\sqrt{-b^2}B\right)\right)+2ab\left(bB-A\sqrt{-b^2}\right)+b^2\left(Ab\right.\right.}{\sqrt{-b^2}\sqrt{a+\sqrt{-b}}}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cot[c + d*x])^(3/2)*(A + B*Cot[c + d*x]),x]
```

```
[Out] -1/3*((3*Sqrt[a - Sqrt[-b^2]]*(-2*a*b*(A*Sqrt[-b^2] + b*B) + a^2*(A*b - Sqr
t[-b^2]*B) + b^2*(-(A*b) + Sqrt[-b^2]*B))*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/
Sqrt[a - Sqrt[-b^2]]])/(b^2 + a*Sqrt[-b^2]) + (3*(2*a*b*(-(A*Sqrt[-b^2]) +
b*B) - a^2*(A*b + Sqrt[-b^2]*B) + b^2*(A*b + Sqrt[-b^2]*B))*ArcTanh[Sqrt[a
+ b*Cot[c + d*x]]/Sqrt[a + Sqrt[-b^2]]])/(Sqrt[-b^2]*Sqrt[a + Sqrt[-b^2]])
+ 6*(A*b + a*B)*Sqrt[a + b*Cot[c + d*x]] + 2*B*(a + b*Cot[c + d*x])^(3/2))/
d
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(3/2)*(A+B*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (B\cot(dx+c)+A)(b\cot(dx+c)+a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(3/2)*(A+B*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((B*cot(d*x + c) + A)*(b*cot(d*x + c) + a)^(3/2), x)
```

maple [B] time = 0.54, size = 1665, normalized size = 11.10

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^(3/2)*(A+B*cot(d*x+c)),x)
```

```
[Out] 1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(
a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^2-1/d*b/(2*(a^2+b
^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c
))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A*(a^2+b^2)^(1/2)+1/4/d/b*ln(b*cot
(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1
/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2)*a+1/d/(2*(a^2+b^2)^(1/
2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2
))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*(a^2+b^2)^(1/2)*a-1/d/(2*(a^2+b^2)^(1/2
)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2)
)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*b^2+1/4/d*b*ln(b*cot(d*x+c)+a+(a+b*cot(d
*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^
(1/2)+2*a)^(1/2)-1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2-1
/4/d*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)
+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2)+1/2/d*ln(
b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^
2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-2/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(
1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^
2+b^2)^(1/2)-2*a)^(1/2))*A*a-1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a
+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)
^(1/2))*B*a^2+2/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2
)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A*a-1
/4/d/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)
-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2)*a-1/d/(
2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*c
ot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*(a^2+b^2)^(1/2)*a-1/4/d*
b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a
^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+1/d*b/(2*(a^2+b^2)^(1/2)-2*a
)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*
(a^2+b^2)^(1/2)-2*a)^(1/2))*A*(a^2+b^2)^(1/2)+1/4/d/b*ln((a+b*cot(d*x+c))^(
1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^
2+b^2)^(1/2)+2*a)^(1/2)*a^2+1/4/d*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1
/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)*(a^2+b^2)^(1/2)-1/2/d*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)
^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a+1/
d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^
2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*b^2-2/d*A*b*(a+b*cot(
d*x+c))^(1/2)-2/d*B*(a+b*cot(d*x+c))^(1/2)*a-2/3*B*(a+b*cot(d*x+c))^(3/2)/d
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(3/2)*(A+B*cot(d*x+c)),x, algorithm="maxima")
```

[Out] Timed out

mupad [B] time = 13.76, size = 2823, normalized size = 18.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))*(a + b*cot(c + d*x))^(3/2),x)
```

```
[Out] log((16*A^3*a*b^3*(a^2 + b^2)^2)/d^3 - (((16*b^2*(((-A^4*b^2*d^4*(3*a^2 - b
^2)^2)^(1/2) - A^2*a^3*d^2 + 3*A^2*a*b^2*d^2)/d^4)^(1/2)*(A*b^3 + A*a^2*b +
 a*d*(((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - A^2*a^3*d^2 + 3*A^2*a*b^2*d^2
)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d + (16*A^2*b^2*(a + b*cot(c + d*
x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2)*(((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1
/2) - A^2*a^3*d^2 + 3*A^2*a*b^2*d^2)/d^4)^(1/2))/2)*((6*A^4*a^2*b^4*d^4 - A
^4*b^6*d^4 - 9*A^4*a^4*b^2*d^4)^(1/2)/(4*d^4) - (A^2*a^3)/(4*d^2) + (3*A^2*
a*b^2)/(4*d^2))^(1/2) - log((16*A^3*a*b^3*(a^2 + b^2)^2)/d^3 - (((16*b^2*((
(-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - A^2*a^3*d^2 + 3*A^2*a*b^2*d^2)/d^4)^
(1/2)*(A*b^3 + A*a^2*b - a*d*(((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - A^2*a
^3*d^2 + 3*A^2*a*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d - (16*A
^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2)*(((-A^4*b^2
*d^4*(3*a^2 - b^2)^2)^(1/2) - A^2*a^3*d^2 + 3*A^2*a*b^2*d^2)/d^4)^(1/2))/2)
*(((6*A^4*a^2*b^4*d^4 - A^4*b^6*d^4 - 9*A^4*a^4*b^2*d^4)^(1/2) - A^2*a^3*d^
2 + 3*A^2*a*b^2*d^2)/(4*d^4))^(1/2) - log((16*A^3*a*b^3*(a^2 + b^2)^2)/d^3
- (((16*b^2*(-((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + A^2*a^3*d^2 - 3*A^2*a
*b^2*d^2)/d^4)^(1/2)*(A*b^3 + A*a^2*b - a*d*(-((-A^4*b^2*d^4*(3*a^2 - b^2)^
2)^(1/2) + A^2*a^3*d^2 - 3*A^2*a*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(
1/2)))/d - (16*A^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/
d^2)*(-((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + A^2*a^3*d^2 - 3*A^2*a*b^2*d^
2)/d^4)^(1/2))/2)*(-((6*A^4*a^2*b^4*d^4 - A^4*b^6*d^4 - 9*A^4*a^4*b^2*d^4)^
(1/2) + A^2*a^3*d^2 - 3*A^2*a*b^2*d^2)/(4*d^4))^(1/2) + log((16*A^3*a*b^3*(
a^2 + b^2)^2)/d^3 - (((16*b^2*(-((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + A^2
*a^3*d^2 - 3*A^2*a*b^2*d^2)/d^4)^(1/2)*(A*b^3 + A*a^2*b + a*d*(-((-A^4*b^2*
d^4*(3*a^2 - b^2)^2)^(1/2) + A^2*a^3*d^2 - 3*A^2*a*b^2*d^2)/d^4)^(1/2)*(a +
 b*cot(c + d*x))^(1/2)))/d + (16*A^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 +
b^4 - 6*a^2*b^2))/d^2)*(-((-A^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + A^2*a^3*d^
2 - 3*A^2*a*b^2*d^2)/d^4)^(1/2))/2)*((3*A^2*a*b^2)/(4*d^2) - (A^2*a^3)/(4*d
^2) - (6*A^4*a^2*b^4*d^4 - A^4*b^6*d^4 - 9*A^4*a^4*b^2*d^4)^(1/2)/(4*d^4))^
(1/2) - log((8*B^3*b^2*(a^2 - b^2)*(a^2 + b^2)^2)/d^3 - (((16*B^2*b^2*(a +
b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 + (16*a*b^2*(((-B^4*b^2*
d^4*(3*a^2 - b^2)^2)^(1/2) + B^2*a^3*d^2 - 3*B^2*a*b^2*d^2)/d^4)^(1/2)*(B*a
^2 + B*b^2 - d*(((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + B^2*a^3*d^2 - 3*B^2
*a*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d)*(((-B^4*b^2*d^4*(3*a
^2 - b^2)^2)^(1/2) + B^2*a^3*d^2 - 3*B^2*a*b^2*d^2)/d^4)^(1/2))/2)*(((6*B^4
*a^2*b^4*d^4 - B^4*b^6*d^4 - 9*B^4*a^4*b^2*d^4)^(1/2) + B^2*a^3*d^2 - 3*B^2
```

```
*a*b^2*d^2)/(4*d^4))^(1/2) - log((8*B^3*b^2*(a^2 - b^2)*(a^2 + b^2)^2)/d^3
- (((16*B^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 + (
16*a*b^2*(-((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - B^2*a^3*d^2 + 3*B^2*a*b^
2*d^2)/d^4)^(1/2)*(B*a^2 + B*b^2 - d*(-((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2
) - B^2*a^3*d^2 + 3*B^2*a*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/
d)*(-((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - B^2*a^3*d^2 + 3*B^2*a*b^2*d^2)
/d^4)^(1/2))/2)*(-((6*B^4*a^2*b^4*d^4 - B^4*b^6*d^4 - 9*B^4*a^4*b^2*d^4)^(1
/2) - B^2*a^3*d^2 + 3*B^2*a*b^2*d^2)/(4*d^4))^(1/2) + log((((16*B^2*b^2*(a
+ b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 - (16*a*b^2*(((-B^4*b^
2*d^4*(3*a^2 - b^2)^2)^(1/2) + B^2*a^3*d^2 - 3*B^2*a*b^2*d^2)/d^4)^(1/2)*(B
*a^2 + B*b^2 + d*(((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + B^2*a^3*d^2 - 3*B
^2*a*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d)*(((-B^4*b^2*d^4*(3
*a^2 - b^2)^2)^(1/2) + B^2*a^3*d^2 - 3*B^2*a*b^2*d^2)/d^4)^(1/2))/2 + (8*B^
3*b^2*(a^2 - b^2)*(a^2 + b^2)^2)/d^3)*((6*B^4*a^2*b^4*d^4 - B^4*b^6*d^4 - 9
*B^4*a^4*b^2*d^4)^(1/2)/(4*d^4) + (B^2*a^3)/(4*d^2) - (3*B^2*a*b^2)/(4*d^2)
)^(1/2) + log((((16*B^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b
^2))/d^2 - (16*a*b^2*(-((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - B^2*a^3*d^2
+ 3*B^2*a*b^2*d^2)/d^4)^(1/2)*(B*a^2 + B*b^2 + d*(-((-B^4*b^2*d^4*(3*a^2 -
b^2)^2)^(1/2) - B^2*a^3*d^2 + 3*B^2*a*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*
x))^(1/2)))/d)*(-((-B^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - B^2*a^3*d^2 + 3*B^
2*a*b^2*d^2)/d^4)^(1/2))/2 + (8*B^3*b^2*(a^2 - b^2)*(a^2 + b^2)^2)/d^3)*((B
^2*a^3)/(4*d^2) - (6*B^4*a^2*b^4*d^4 - B^4*b^6*d^4 - 9*B^4*a^4*b^2*d^4)^(1/
2)/(4*d^4) - (3*B^2*a*b^2)/(4*d^2))^(1/2) - (2*B*(a + b*cot(c + d*x))^(3/2)
)/(3*d) - (2*A*b*(a + b*cot(c + d*x))^(1/2))/d - (2*B*a*(a + b*cot(c + d*x)
)^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (A + B\cot(c + dx))(a + b\cot(c + dx))^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**(3/2)*(A+B*cot(d*x+c)),x)
```

```
[Out] Integral((A + B*cot(c + d*x))*(a + b*cot(c + d*x))**(3/2), x)
```

3.97 $\int \sqrt{a+b\cot(c+dx)}\,(A+B\cot(c+dx))\,dx$

Optimal. Leaf size=122

$$\frac{\sqrt{a-ib}\,(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{\sqrt{a+ib}\,(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d}-\frac{2B\sqrt{a+b\cot(c+dx)}}{d}$$

```
[Out] (I*A+B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))*(a-I*b)^(1/2)/d-(I*A-
B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))*(a+I*b)^(1/2)/d-2*B*(a+b*c
ot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.26, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3528, 3539, 3537, 63, 208}

$$\frac{\sqrt{a-ib}\,(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{\sqrt{a+ib}\,(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d}-\frac{2B\sqrt{a+b\cot(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + b*Cot[c + d*x]]*(A + B*Cot[c + d*x]),x]
```

```
[Out] (Sqrt[a - I*b]*(I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/d
 - (Sqrt[a + I*b]*(I*A - B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]]
)/d - (2*B*Sqrt[a + b*Cot[c + d*x]])/d
```

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]
```

Rule 3528

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[(d*(a + b*Tan[e + f*x])^m)/(f*m), x] + Int
[(a + b*Tan[e + f*x])^(m - 1)*Simp[a*c - b*d + (b*c + a*d)*Tan[e + f*x], x]
, x] /; FreeQ[{a, b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2,
```

```
0] && GtQ[m, 0]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \sqrt{a+b\cot(c+dx)}\,(A+B\cot(c+dx))\,dx &= -\frac{2B\sqrt{a+b\cot(c+dx)}}{d}+\int \frac{aA-bB+(Ab+aB)\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx\\ &= -\frac{2B\sqrt{a+b\cot(c+dx)}}{d}+\frac{1}{2}((a-ib)(A-iB))\int \frac{1+i\cot(c+dx)}{\sqrt{a+b\cot(c+a}}\\ &= -\frac{2B\sqrt{a+b\cot(c+dx)}}{d}-\frac{(i(a-ib)(A-iB))\,\mathrm{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a-ib}}\right.}{2d}\\ &= -\frac{2B\sqrt{a+b\cot(c+dx)}}{d}+\frac{((a-ib)(A-iB))\,\mathrm{Subst}\left(\int \frac{1}{-1-\frac{ia}{b}+\frac{ix^2}{b}}\,dx\right.}{bd}\\ &= \frac{\sqrt{a-ib}\,(iA+B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}-\frac{\sqrt{a+ib}\,(iA-B)\tanh^{-1}}{d}\end{aligned}$$

Mathematica [A] time = 0.57, size = 212, normalized size = 1.74

$$-\frac{\frac{\left(aAb-a\sqrt{-b^2}\,B-A\sqrt{-b^2}\,b+b^2(-B)\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{-b^2}}}\right)}{\sqrt{-b^2}\sqrt{a-\sqrt{-b^2}}}-\frac{\left(aAb+a\sqrt{-b^2}\,B+A\sqrt{-b^2}\,b+b^2(-B)\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+\sqrt{-b^2}}}\right)}{\sqrt{-b^2}\sqrt{a+\sqrt{-b^2}}}+2B\sqrt{a+b\cot(c}}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*Cot[c + d*x]]*(A + B*Cot[c + d*x]),x]
```

```
[Out] -((((a*A*b - A*b*Sqrt[-b^2] - b^2*B - a*Sqrt[-b^2]*B)*ArcTanh[Sqrt[a + b*Co
t[c + d*x]]/Sqrt[a - Sqrt[-b^2]]])/(Sqrt[-b^2]*Sqrt[a - Sqrt[-b^2]]) - ((a*
A*b + A*b*Sqrt[-b^2] - b^2*B + a*Sqrt[-b^2]*B)*ArcTanh[Sqrt[a + b*Cot[c + d
*x]]/Sqrt[a + Sqrt[-b^2]]])/(Sqrt[-b^2]*Sqrt[a + Sqrt[-b^2]]) + 2*B*Sqrt[a
+ b*Cot[c + d*x]])/d)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(1/2)*(A+B*cot(d*x+c)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (B\cot(dx+c)+A)\sqrt{b\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(1/2)*(A+B*cot(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((B*cot(d*x + c) + A)*sqrt(b*cot(d*x + c) + a), x)
```

maple [B] time = 0.53, size = 968, normalized size = 7.93

$$-\frac{2B\sqrt{a+b\cot(dx+c)}}{d}+\frac{\ln\left(b\cot(dx+c)+a+\sqrt{a+b\cot(dx+c)}\,\sqrt{2\sqrt{a^2+b^2}+2a}+\sqrt{a^2+b^2}\right)A\sqrt{2\sqrt{a^2}}}{4db}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*cot(d*x+c))^(1/2)*(A+B*cot(d*x+c)),x)
```

```
[Out] -2*B*(a+b*cot(d*x+c))^(1/2)/d+1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1
/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a
)^(1/2)*(a^2+b^2)^(1/2)-1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2
*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2
)*a+1/4/d*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^
(1/2)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-1/d*b/(2*(a^2+b^2)^(
1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1
/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A+1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arc
```

```
tan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(
1/2)-2*a)^(1/2))*B*(a^2+b^2)^(1/2)-1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan
((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2
)-2*a)^(1/2))*B*a-1/4/d/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)
^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2
+b^2)^(1/2)+1/4/d/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)
-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-1/4/d*ln
((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b
^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+1/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1
/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2
+b^2)^(1/2)-2*a)^(1/2))*A-1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2
+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1
/2))*B*(a^2+b^2)^(1/2)+1/d/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^
2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)
)*B*a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (B\cot(dx+c)+A)\sqrt{b\cot(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))^(1/2)*(A+B*cot(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((B*cot(d*x + c) + A)*sqrt(b*cot(d*x + c) + a), x)
```

mupad [B] time = 3.03, size = 843, normalized size = 6.91

$$\operatorname{atanh}\left(\frac{d^3\left(\frac{16\left(A^2b^4-A^2a^2b^2\right)\sqrt{a+b\cot(c+dx)}}{d^2}+\frac{16ab^2\left(\sqrt{-A^4b^2d^4}+A^2ad^2\right)\sqrt{a+b\cot(c+dx)}}{d^4}\right)\sqrt{-\frac{\sqrt{-A^4b^2d^4}+A^2ad^2}{d^4}}}{16\left(A^3a^2b^3+A^3b^5\right)}\right)\sqrt{-\frac{\sqrt{-A}}{}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))*(a + b*cot(c + d*x))^(1/2),x)
```

```
[Out] atanh((d^3*((16*(A^2*b^4 - A^2*a^2*b^2)*(a + b*cot(c + d*x))^(1/2))/d^2 + (
16*a*b^2*((-A^4*b^2*d^4)^(1/2) + A^2*a*d^2)*(a + b*cot(c + d*x))^(1/2))/d^4
)*(-((-A^4*b^2*d^4)^(1/2) + A^2*a*d^2)/d^4)^(1/2))/(16*(A^3*b^5 + A^3*a^2*b
^3)))*(-((-A^4*b^2*d^4)^(1/2) + A^2*a*d^2)/d^4)^(1/2) + atanh((d^3*((16*(A^
2*b^4 - A^2*a^2*b^2)*(a + b*cot(c + d*x))^(1/2))/d^2 - (16*a*b^2*((-A^4*b^2
*d^4)^(1/2) - A^2*a*d^2)*(a + b*cot(c + d*x))^(1/2))/d^4)*(((-A^4*b^2*d^4)^
(1/2) - A^2*a*d^2)/d^4)^(1/2))/(16*(A^3*b^5 + A^3*a^2*b^3)))*(((-A^4*b^2*d^
4)^(1/2) - A^2*a*d^2)/d^4)^(1/2) + 2*atanh((32*B^2*b^4*((-B^4*b^2*d^4)^(1/2
```

```
)/(4*d^4) + (B^2*a)/(4*d^2))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*B*b^4*(
-B^4*b^2*d^4)^(1/2))/d^3 + (16*B*a^2*b^2*(-B^4*b^2*d^4)^(1/2))/d^3) + (32*a
*b^2*((-B^4*b^2*d^4)^(1/2)/(4*d^4) + (B^2*a)/(4*d^2))^(1/2)*(a + b*cot(c +
d*x))^(1/2)*(-B^4*b^2*d^4)^(1/2))/((16*B*b^4*(-B^4*b^2*d^4)^(1/2))/d + (16*
B*a^2*b^2*(-B^4*b^2*d^4)^(1/2))/d))*(((-B^4*b^2*d^4)^(1/2) + B^2*a*d^2)/(4*
d^4))^(1/2) - 2*atanh((32*B^2*b^4*((B^2*a)/(4*d^2) - (-B^4*b^2*d^4)^(1/2)/(
4*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*B*b^4*(-B^4*b^2*d^4)^(1/2))/
d^3 + (16*B*a^2*b^2*(-B^4*b^2*d^4)^(1/2))/d^3) - (32*a*b^2*((B^2*a)/(4*d^2)
 - (-B^4*b^2*d^4)^(1/2)/(4*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(-B^4*b^2
*d^4)^(1/2))/((16*B*b^4*(-B^4*b^2*d^4)^(1/2))/d + (16*B*a^2*b^2*(-B^4*b^2*d
^4)^(1/2))/d))*(-((-B^4*b^2*d^4)^(1/2) - B^2*a*d^2)/(4*d^4))^(1/2) - (2*B*(
a + b*cot(c + d*x))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (A + B \cot(c + dx)) \sqrt{a + b \cot(c + dx)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*cot(d*x+c))**(1/2)*(A+B*cot(d*x+c)),x)
```

```
[Out] Integral((A + B*cot(c + d*x))*sqrt(a + b*cot(c + d*x)), x)
```

3.98 $\int(-a+b\cot(c+dx))(a+b\cot(c+dx))^{5/2}\,dx$

Optimal. Leaf size=151

$$\frac{2b\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2b(a+b\cot(c+dx))^{5/2}}{5d}-\frac{(-b+ia)(a-ib)^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}+\frac{(a+ib)^{5/2}}{}$$

```
[Out] -(I*a-b)*(a-I*b)^(5/2)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/d+(a+I
*b)^(5/2)*(I*a+b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/d-2/5*b*(a+
b*cot(d*x+c))^(5/2)/d+2*b*(a^2+b^2)*(a+b*cot(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.28, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259, Rules used = {3528, 12, 3482, 3539, 3537, 63, 208}

$$\frac{2b\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}{d}-\frac{2b(a+b\cot(c+dx))^{5/2}}{5d}-\frac{(-b+ia)(a-ib)^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d}+\frac{(a+ib)^{5/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(-a + b*Cot[c + d*x])*(a + b*Cot[c + d*x])^(5/2),x]
```

```
[Out] -(((I*a - b)*(a - I*b)^(5/2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]
])/d) + ((a + I*b)^(5/2)*(I*a + b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a
+ I*b]])/d + (2*b*(a^2 + b^2)*Sqrt[a + b*Cot[c + d*x]])/d - (2*b*(a + b*Cot
[c + d*x])^(5/2))/(5*d)
```

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 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]
```

Rule 3482

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(b*(a +
b*Tan[c + d*x])^(n - 1))/(d*(n - 1)), x] + Int[(a^2 - b^2 + 2*a*b*Tan[c + d
*x])*(a + b*Tan[c + d*x])^(n - 2), x] /; FreeQ[{a, b, c, d}, x] && NeQ[a^2
+ b^2, 0] && GtQ[n, 1]
```

Rule 3528

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

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int (-a + b\cot(c+dx))(a + b\cot(c+dx))^{5/2}\,dx = -\frac{2b(a+b\cot(c+dx))^{5/2}}{5d} + \int \left(-a^2-b^2\right)(a+b\cot(c+dx))^{3/2}$$
$$= -\frac{2b(a+b\cot(c+dx))^{5/2}}{5d} + \left(-a^2-b^2\right)\int (a+b\cot(c+dx))^{3/2}$$
$$= \frac{2b\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}{d} - \frac{2b(a+b\cot(c+dx))^{5/2}}{5d} + \Big(-$$
$$= \frac{2b\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}{d} - \frac{2b(a+b\cot(c+dx))^{5/2}}{5d} - \frac{1}{2}\Big($$
$$= \frac{2b\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}{d} - \frac{2b(a+b\cot(c+dx))^{5/2}}{5d} - \frac{((a}{}$$
$$= \frac{2b\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}{d} - \frac{2b(a+b\cot(c+dx))^{5/2}}{5d} - \frac{((a}{}$$
$$= -\frac{(ia-b)(a-ib)^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d} + \frac{(a+ib)^{5/2}(ia+b)\,\mathrm{t}}{}$$

Mathematica [A] time = 3.96, size = 253, normalized size = 1.68

$$\frac{\sin(c+dx)(b\cot(c+dx)-a)(a+b\cot(c+dx))^{5/2}\left(\frac{2b\left(-4a^2+2ab\cot(c+dx)+b^2\csc^2(c+dx)-6b^2\right)}{(a+b\cot(c+dx))^2} + \frac{5i\left(a^2+b^2\right)\left((a-ib)^2\sqrt{a+ib}\,\tanh^{-1}\right.}{\sqrt{a}}\right.}{5d(a\sin(c+dx)-b\cos(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-a + b*Cot[c + d*x])*(a + b*Cot[c + d*x])^(5/2),x]
```

```
[Out] ((-a + b*Cot[c + d*x])*(a + b*Cot[c + d*x])^(5/2)*(((5*I)*(a^2 + b^2)*((a -
 I*b)^2*Sqrt[a + I*b]*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]] - Sqr
t[a - I*b]*(a + I*b)^2*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]]))/(S
qrt[a - I*b]*Sqrt[a + I*b]*(a + b*Cot[c + d*x])^(5/2)) + (2*b*(-4*a^2 - 6*b
^2 + 2*a*b*Cot[c + d*x] + b^2*Csc[c + d*x]^2))/(a + b*Cot[c + d*x])^2)*Sin[
c + d*x])/(5*d*(-(b*Cos[c + d*x]) + a*Sin[c + d*x]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)^{\frac{5}{2}}(b\cot(dx+c)-a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^(5/2)*(b*cot(d*x + c) - a), x)
```

maple [B] time = 0.56, size = 1375, normalized size = 9.11

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(5/2),x)
```

```
[Out] -2/5*b*(a+b*cot(d*x+c))^(5/2)/d+2/d*b*a^2*(a+b*cot(d*x+c))^(1/2)+2/d*b^3*(a
+b*cot(d*x+c))^(1/2)-1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a
^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^
2+b^2)^(1/2)*a^3-1/4/d*b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^
2)^(1/2)*a+1/4/d/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1
/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4-1/4/d*b^3
*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^
2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+2/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(
1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^
2+b^2)^(1/2)-2*a)^(1/2))*a^3+2/d*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((
2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-
2*a)^(1/2))*a-1/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c)
)^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*(a^2+
b^2)^(1/2)*a^2-1/d*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x
+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*(a
^2+b^2)^(1/2)+1/4/d/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/
2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^
(1/2)*a^3+1/4/d*b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b
*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a^2+b^2)^(1/2
)*a-1/4/d/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d
*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4+1/4/d*b^3*ln((a+
b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^
(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*ar
```

```
ctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^
(1/2)-2*a)^(1/2))*a^3-2/d*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2
+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1
/2))*a+1/d*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^
(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*(a^2+b^2)^(1
/2)*a^2+1/d*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*
a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*(a^2+b^2)
^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)^{\frac{5}{2}}(b\cot(dx+c)-a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cot(d*x + c) + a)^(5/2)*(b*cot(d*x + c) - a), x)
```

mupad [B] time = 26.56, size = 3442, normalized size = 22.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a + b*cot(c + d*x))^(5/2)*(a - b*cot(c + d*x)),x)
```

```
[Out] log(((((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - a^7*d^2 - 5*a^3*
b^4*d^2 + 10*a^5*b^2*d^2)/d^4)^(1/2)*(((((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^
2*b^2)^2)^(1/2) - a^7*d^2 - 5*a^3*b^4*d^2 + 10*a^5*b^2*d^2)/d^4)^(1/2)*(64*
a^2*b^5 + 64*a^4*b^3 - 32*a*b^2*d*(((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2
)^2)^(1/2) - a^7*d^2 - 5*a^3*b^4*d^2 + 10*a^5*b^2*d^2)/d^4)^(1/2)*(a + b*co
t(c + d*x))^(1/2)))/(2*d) - (16*a^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b
^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/2 - (8*a^3*b^3*(3*a^2 - b^2)*(a^2 + b^
2)^3)/d^3)*((20*a^6*b^8*d^4 - a^4*b^10*d^4 - 110*a^8*b^6*d^4 + 100*a^10*b^4
*d^4 - 25*a^12*b^2*d^4)^(1/2)/(4*d^4) - a^7/(4*d^2) - (5*a^3*b^4)/(4*d^2) +
 (5*a^5*b^2)/(2*d^2))^(1/2) - log(((-((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b
^2)^2)^(1/2) + a^7*d^2 + 5*a^3*b^4*d^2 - 10*a^5*b^2*d^2)/d^4)^(1/2)*(((-((-
a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + a^7*d^2 + 5*a^3*b^4*d^2 -
 10*a^5*b^2*d^2)/d^4)^(1/2)*(64*a^2*b^5 + 64*a^4*b^3 + 32*a*b^2*d*(-((-a^4*
b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + a^7*d^2 + 5*a^3*b^4*d^2 - 10*
a^5*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) + (16*a^2*b^2*(a
 + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/2 - (
8*a^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)/d^3)*(-(a^7*d^2 + (20*a^6*b^8*d^4 -
a^4*b^10*d^4 - 110*a^8*b^6*d^4 + 100*a^10*b^4*d^4 - 25*a^12*b^2*d^4)^(1/2)
+ 5*a^3*b^4*d^2 - 10*a^5*b^2*d^2)/(4*d^4))^(1/2) + log(((-((-a^4*b^2*d^4*(5
```

```
*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + a^7*d^2 + 5*a^3*b^4*d^2 - 10*a^5*b^2*d^
2)/d^4)^(1/2)*(((-((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + a^7*
d^2 + 5*a^3*b^4*d^2 - 10*a^5*b^2*d^2)/d^4)^(1/2)*(64*a^2*b^5 + 64*a^4*b^3 -
 32*a*b^2*d*(-((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + a^7*d^2
+ 5*a^3*b^4*d^2 - 10*a^5*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(
2*d) - (16*a^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*
a^4*b^2))/d^2))/2 - (8*a^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)/d^3)*((5*a^5*b^
2)/(2*d^2) - a^7/(4*d^2) - (5*a^3*b^4)/(4*d^2) - (20*a^6*b^8*d^4 - a^4*b^10
*d^4 - 110*a^8*b^6*d^4 + 100*a^10*b^4*d^4 - 25*a^12*b^2*d^4)^(1/2)/(4*d^4))
^(1/2) - ((4*a^2*b)/d - (2*b*(a^2 + b^2))/d)*(a + b*cot(c + d*x))^(1/2) - l
og((((((-b^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + 5*a*b^6*d^2 - 10*a^
3*b^4*d^2 + a^5*b^2*d^2)/d^4)^(1/2)*(32*b^7 - 32*a^4*b^3 + 32*a*b^2*d*(((-b
^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + 5*a*b^6*d^2 - 10*a^3*b^4*d^2 +
 a^5*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) + (16*(a + b*co
t(c + d*x))^(1/2)*(b^10 - 15*a^2*b^8 + 15*a^4*b^6 - a^6*b^4))/d^2)*(((-b^6*
d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) + 5*a*b^6*d^2 - 10*a^3*b^4*d^2 + a^
5*b^2*d^2)/d^4)^(1/2))/2 + (8*a*b^5*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3)*(((20
*a^2*b^12*d^4 - b^14*d^4 - 110*a^4*b^10*d^4 + 100*a^6*b^8*d^4 - 25*a^8*b^6*
d^4)^(1/2) + 5*a*b^6*d^2 - 10*a^3*b^4*d^2 + a^5*b^2*d^2)/(4*d^4))^(1/2) + l
og((8*a*b^5*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3 - ((((((-b^6*d^4*(5*a^4 + b^4
 - 10*a^2*b^2)^2)^(1/2) + 5*a*b^6*d^2 - 10*a^3*b^4*d^2 + a^5*b^2*d^2)/d^4)^(
1/2)*(32*a^4*b^3 - 32*b^7 + 32*a*b^2*d*(((-b^6*d^4*(5*a^4 + b^4 - 10*a^2*b^
2)^2)^(1/2) + 5*a*b^6*d^2 - 10*a^3*b^4*d^2 + a^5*b^2*d^2)/d^4)^(1/2)*(a + b
*cot(c + d*x))^(1/2)))/(2*d) + (16*(a + b*cot(c + d*x))^(1/2)*(b^10 - 15*a^
2*b^8 + 15*a^4*b^6 - a^6*b^4))/d^2)*(((-b^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^
2)^(1/2) + 5*a*b^6*d^2 - 10*a^3*b^4*d^2 + a^5*b^2*d^2)/d^4)^(1/2))/2)*((20*
a^2*b^12*d^4 - b^14*d^4 - 110*a^4*b^10*d^4 + 100*a^6*b^8*d^4 - 25*a^8*b^6*d
^4)^(1/2)/(4*d^4) + (5*a*b^6)/(4*d^2) - (5*a^3*b^4)/(2*d^2) + (a^5*b^2)/(4*
d^2))^(1/2) - log(((((-((-b^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - 5*a
*b^6*d^2 + 10*a^3*b^4*d^2 - a^5*b^2*d^2)/d^4)^(1/2)*(32*b^7 - 32*a^4*b^3 +
32*a*b^2*d*(-((-b^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - 5*a*b^6*d^2 +
 10*a^3*b^4*d^2 - a^5*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d
) + (16*(a + b*cot(c + d*x))^(1/2)*(b^10 - 15*a^2*b^8 + 15*a^4*b^6 - a^6*b^
4))/d^2)*(-((-b^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - 5*a*b^6*d^2 + 1
0*a^3*b^4*d^2 - a^5*b^2*d^2)/d^4)^(1/2))/2 + (8*a*b^5*(a^2 - 3*b^2)*(a^2 +
b^2)^3)/d^3)*(-((20*a^2*b^12*d^4 - b^14*d^4 - 110*a^4*b^10*d^4 + 100*a^6*b^
8*d^4 - 25*a^8*b^6*d^4)^(1/2) - 5*a*b^6*d^2 + 10*a^3*b^4*d^2 - a^5*b^2*d^2)
/(4*d^4))^(1/2) + log((8*a*b^5*(a^2 - 3*b^2)*(a^2 + b^2)^3)/d^3 - ((((-((-b
^6*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - 5*a*b^6*d^2 + 10*a^3*b^4*d^2 -
 a^5*b^2*d^2)/d^4)^(1/2)*(32*a^4*b^3 - 32*b^7 + 32*a*b^2*d*(-((-b^6*d^4*(5*
a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - 5*a*b^6*d^2 + 10*a^3*b^4*d^2 - a^5*b^2*d
^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) + (16*(a + b*cot(c + d*x)
)^(1/2)*(b^10 - 15*a^2*b^8 + 15*a^4*b^6 - a^6*b^4))/d^2)*(-((-b^6*d^4*(5*a^
4 + b^4 - 10*a^2*b^2)^2)^(1/2) - 5*a*b^6*d^2 + 10*a^3*b^4*d^2 - a^5*b^2*d^2
)/d^4)^(1/2))/2)*((5*a*b^6)/(4*d^2) - (20*a^2*b^12*d^4 - b^14*d^4 - 110*a^4
```

```
*b^10*d^4 + 100*a^6*b^8*d^4 - 25*a^8*b^6*d^4)^(1/2)/(4*d^4) - (5*a^3*b^4)/(
2*d^2) + (a^5*b^2)/(4*d^2))^(1/2) - log(((((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*
a^2*b^2)^2)^(1/2) - a^7*d^2 - 5*a^3*b^4*d^2 + 10*a^5*b^2*d^2)/d^4)^(1/2)*((
(((-a^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - a^7*d^2 - 5*a^3*b^4*d
^2 + 10*a^5*b^2*d^2)/d^4)^(1/2)*(64*a^2*b^5 + 64*a^4*b^3 + 32*a*b^2*d*(((-a
^4*b^2*d^4*(5*a^4 + b^4 - 10*a^2*b^2)^2)^(1/2) - a^7*d^2 - 5*a^3*b^4*d^2 +
10*a^5*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/(2*d) + (16*a^2*b^2
*(a + b*cot(c + d*x))^(1/2)*(a^6 - b^6 + 15*a^2*b^4 - 15*a^4*b^2))/d^2))/2
- (8*a^3*b^3*(3*a^2 - b^2)*(a^2 + b^2)^3)/d^3)*(-(a^7*d^2 - (20*a^6*b^8*d^4
 - a^4*b^10*d^4 - 110*a^8*b^6*d^4 + 100*a^10*b^4*d^4 - 25*a^12*b^2*d^4)^(1/
2) + 5*a^3*b^4*d^2 - 10*a^5*b^2*d^2)/(4*d^4))^(1/2) - (2*b*(a + b*cot(c + d
*x))^(5/2))/(5*d) + (4*a^2*b*(a + b*cot(c + d*x))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int a^3\sqrt{a+b\cot(c+dx)}\,dx-\int\left(-b^3\sqrt{a+b\cot(c+dx)}\,\cot^3(c+dx)\right)dx-\int\left(-ab^2\sqrt{a+b\cot(c+dx)}\,\cot^2(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))**(5/2),x)
```

```
[Out] -Integral(a**3*sqrt(a + b*cot(c + d*x)), x) - Integral(-b**3*sqrt(a + b*cot
(c + d*x))*cot(c + d*x)**3, x) - Integral(-a*b**2*sqrt(a + b*cot(c + d*x))*
cot(c + d*x)**2, x) - Integral(a**2*b*sqrt(a + b*cot(c + d*x))*cot(c + d*x)
, x)
```

3.99 $\int (-a+b\cot(c+dx))(a+b\cot(c+dx))^{3/2}\,dx$

Optimal. Leaf size=408

$$\frac{b\left(a^2+b^2\right)\log\left(-\sqrt{2}\sqrt{\sqrt{a^2+b^2}+a}\sqrt{a+b\cot(c+dx)}+\sqrt{a^2+b^2}+a+b\cot(c+dx)\right)}{2\sqrt{2}d\sqrt{\sqrt{a^2+b^2}+a}}-\frac{b\left(a^2+b^2\right)\log\left(\sqrt{2}\right.}{}$$

```
[Out] -2/3*b*(a+b*cot(d*x+c))^(3/2)/d+1/2*b*(a^2+b^2)*arctanh((-2^(1/2)*(a+b*cot(
d*x+c))^(1/2)+(a+(a^2+b^2)^(1/2))^(1/2))/(a-(a^2+b^2)^(1/2))^(1/2))/d*2^(1/
2)/(a-(a^2+b^2)^(1/2))^(1/2)-1/2*b*(a^2+b^2)*arctanh((2^(1/2)*(a+b*cot(d*x+
c))^(1/2)+(a+(a^2+b^2)^(1/2))^(1/2))/(a-(a^2+b^2)^(1/2))^(1/2))/d*2^(1/2)/(
a-(a^2+b^2)^(1/2))^(1/2)+1/4*b*(a^2+b^2)*ln(a+b*cot(d*x+c)+(a^2+b^2)^(1/2)-
2^(1/2)*(a+b*cot(d*x+c))^(1/2)*(a+(a^2+b^2)^(1/2))^(1/2))/d*2^(1/2)/(a+(a^2
+b^2)^(1/2))^(1/2)-1/4*b*(a^2+b^2)*ln(a+b*cot(d*x+c)+(a^2+b^2)^(1/2)+2^(1/2
)*(a+b*cot(d*x+c))^(1/2)*(a+(a^2+b^2)^(1/2))^(1/2))/d*2^(1/2)/(a+(a^2+b^2)^
(1/2))^(1/2)
```

Rubi [A] time = 0.51, antiderivative size = 408, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3528, 12, 3485, 700, 1129, 634, 618, 206, 628}

$$\frac{b\left(a^2+b^2\right)\log\left(-\sqrt{2}\sqrt{\sqrt{a^2+b^2}+a}\sqrt{a+b\cot(c+dx)}+\sqrt{a^2+b^2}+a+b\cot(c+dx)\right)}{2\sqrt{2}d\sqrt{\sqrt{a^2+b^2}+a}}-\frac{b\left(a^2+b^2\right)\log\left(\sqrt{2}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(-a + b*Cot[c + d*x])*(a + b*Cot[c + d*x])^(3/2),x]
```

```
[Out] (b*(a^2 + b^2)*ArcTanh[(Sqrt[a + Sqrt[a^2 + b^2]] - Sqrt[2]*Sqrt[a + b*Cot[
c + d*x]])/Sqrt[a - Sqrt[a^2 + b^2]]])/(Sqrt[2]*Sqrt[a - Sqrt[a^2 + b^2]]*d
) - (b*(a^2 + b^2)*ArcTanh[(Sqrt[a + Sqrt[a^2 + b^2]] + Sqrt[2]*Sqrt[a + b*
Cot[c + d*x]])/Sqrt[a - Sqrt[a^2 + b^2]]])/(Sqrt[2]*Sqrt[a - Sqrt[a^2 + b^2
]]*d) - (2*b*(a + b*Cot[c + d*x])^(3/2))/(3*d) + (b*(a^2 + b^2)*Log[a + Sqr
t[a^2 + b^2] + b*Cot[c + d*x] - Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]]*Sqrt[a +
b*Cot[c + d*x]]])/(2*Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]]*d) - (b*(a^2 + b^2)*
Log[a + Sqrt[a^2 + b^2] + b*Cot[c + d*x] + Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]
]*Sqrt[a + b*Cot[c + d*x]]])/(2*Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]]*d)
```

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 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 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 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 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 700

```
Int[Sqrt[(d_) + (e_.)*(x_)]/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[2*e, S
ubst[Int[x^2/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]], x]
 /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1129

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4), x_Symbol] :> With[{q =
 Rt[a/c, 2]}, With[{r = Rt[2*q - b/c, 2]}, Dist[1/(2*c*r), Int[x^(m - 1)/(q
 - r*x + x^2), x], x] - Dist[1/(2*c*r), Int[x^(m - 1)/(q + r*x + x^2), x],
x]]] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && GeQ[m, 1] && LtQ[m, 3
] && NegQ[b^2 - 4*a*c]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3528

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

Rubi steps

$$\int(-a+b\cot(c+dx))(a+b\cot(c+dx))^{3/2}\,dx=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\int\left(-a^2-b^2\right)\sqrt{a+b\cot(c+dx)}\,dx$$

$$=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\left(-a^2-b^2\right)\int\sqrt{a+b\cot(c+dx)}\,dx$$

$$=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\frac{\left(b\left(a^2+b^2\right)\right)\text{Subst}\left(\int\frac{\sqrt{a+x}}{b^2+x^2}dx,x,b\right.}{d}$$

$$=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\frac{\left(2b\left(a^2+b^2\right)\right)\text{Subst}\left(\int\frac{x^2}{a^2+b^2-2ax^2+x}\right.}{d}$$

$$=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\frac{\left(b\left(a^2+b^2\right)\right)\text{Subst}\left(\int\frac{x}{\sqrt{a^2+b^2}-\sqrt{2}\sqrt{a}}\right.}{\sqrt{2}\sqrt{a+}}$$

$$=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\frac{\left(b\left(a^2+b^2\right)\right)\text{Subst}\left(\int\frac{1}{\sqrt{a^2+b^2}-\sqrt{2}\sqrt{a}}\right.}{}$$

$$=-\frac{2b(a+b\cot(c+dx))^{3/2}}{3d}+\frac{b\left(a^2+b^2\right)\log\left(a+\sqrt{a^2+b^2}+b\,\text{c}\right.}{2\sqrt{}}$$

$$=\frac{b\left(a^2+b^2\right)\tanh^{-1}\left(\frac{\sqrt{a+\sqrt{a^2+b^2}}-\sqrt{2}\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{a^2+b^2}}}\right)}{\sqrt{2}\sqrt{a-\sqrt{a^2+b^2}}\,d}-\frac{b\left(a^2+b^2\right)\text{t}}{}$$

Mathematica [C] time = 1.94, size = 178, normalized size = 0.44

$$\frac{\sin^2(c+dx)(b\cot(c+dx)-a)(a+b\cot(c+dx))\left(3i\sqrt{a-ib}\left(a^2+b^2\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)-3i\sqrt{a+ib}\left(a^2+b\right.\right.}{3a^2d\sin^2(c+dx)-3b^2d\cos^2(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-a + b*Cot[c + d*x])*(a + b*Cot[c + d*x])^(3/2),x]
```

```
[Out] ((-a + b*Cot[c + d*x])*(a + b*Cot[c + d*x])*((3*I)*Sqrt[a - I*b]*(a^2 + b^2
)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]] - (3*I)*Sqrt[a + I*b]*(a^
```

```
2 + b^2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]] + 2*b*(a + b*Cot[c
 + d*x])^(3/2))*Sin[c + d*x]^2)/(-3*b^2*d*Cos[c + d*x]^2 + 3*a^2*d*Sin[c +
d*x]^2)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\cot(dx+c)+a)^{\frac{3}{2}}(b\cot(dx+c)-a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) + a)^(3/2)*(b*cot(d*x + c) - a), x)
```

maple [B] time = 0.51, size = 972, normalized size = 2.38

$$-\frac{2b\,(a+b\cot(dx+c))^{\frac{3}{2}}}{3d}+\frac{\sqrt{2\sqrt{a^2+b^2}+2a}\;a^3\ln\left(b\cot(dx+c)+a+\sqrt{a+b\cot(dx+c)}\;\sqrt{2\sqrt{a^2+b^2}+2a}\right.}{4db}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(3/2),x)
```

```
[Out] -2/3*b*(a+b*cot(d*x+c))^(3/2)/d+1/4/d/b*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3*l
n(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+
b^2)^(1/2))+1/4/d*b*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a*ln(b*cot(d*x+c)+a+(a+b*
cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))+1/d*b*a^2/
(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)
^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-1/4/d/b*(2*(a^2+b^2)^(1/2
)+2*a)^(1/2)*(a^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a
^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*a^2-1/4/d*b*(2*(a^2+b^2)^(1/2)+2*
a)^(1/2)*(a^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b
^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))+1/d*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)
*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^
```

```
2)^(1/2)-2*a)^(1/2))-1/4/d/b*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3*ln(b*cot(d*x
+c)+a-(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))
-1/4/d*b*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a*ln(b*cot(d*x+c)+a-(a+b*cot(d*x+c))
^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))+1/d*b*a^2/(2*(a^2+b^2
)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)-(2*(a^2+b^2)^(1/2)+2*a)
^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))+1/4/d/b*(2*(a^2+b^2)^(1/2)+2*a)^(1/2
)*(a^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a-(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/
2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*a^2+1/4/d*b*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*(a
^2+b^2)^(1/2)*ln(b*cot(d*x+c)+a-(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2
*a)^(1/2)+(a^2+b^2)^(1/2))+1/d*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*
(a+b*cot(d*x+c))^(1/2)-(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*
a)^(1/2))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [B] time = 11.96, size = 2529, normalized size = 6.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a + b*cot(c + d*x))^(3/2)*(a - b*cot(c + d*x)),x)
```

```
[Out] log((((16*b^4*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 - (16
*a*b^2*(((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) - 3*a*b^4*d^2 + a^3*b^2*d^2)/d^4)
^(1/2)*(a^2*b + b^3 + d*(((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) - 3*a*b^4*d^2 +
a^3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d)*(((-b^6*d^4*(3*a^2
- b^2)^2)^(1/2) - 3*a*b^4*d^2 + a^3*b^2*d^2)/d^4)^(1/2))/2 + (8*b^5*(a^2 -
b^2)*(a^2 + b^2)^2)/d^3)*((6*a^2*b^8*d^4 - b^10*d^4 - 9*a^4*b^6*d^4)^(1/2)/
(4*d^4) - (3*a*b^4)/(4*d^2) + (a^3*b^2)/(4*d^2))^(1/2) - log((8*b^5*(a^2 -
b^2)*(a^2 + b^2)^2)/d^3 - (((16*b^4*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 -
 6*a^2*b^2))/d^2 + (16*a*b^2*(-((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) + 3*a*b^4*
d^2 - a^3*b^2*d^2)/d^4)^(1/2)*(a^2*b + b^3 - d*(-((-b^6*d^4*(3*a^2 - b^2)^2
)^(1/2) + 3*a*b^4*d^2 - a^3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2))
)/d)*(-((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) + 3*a*b^4*d^2 - a^3*b^2*d^2)/d^4)^
(1/2))/2)*(-((6*a^2*b^8*d^4 - b^10*d^4 - 9*a^4*b^6*d^4)^(1/2) + 3*a*b^4*d^2
 - a^3*b^2*d^2)/(4*d^4))^(1/2) - log((8*b^5*(a^2 - b^2)*(a^2 + b^2)^2)/d^3
- (((16*b^4*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 + (16*a
*b^2*(((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) - 3*a*b^4*d^2 + a^3*b^2*d^2)/d^4)^(
```

```
1/2)*(a^2*b + b^3 - d*(((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) - 3*a*b^4*d^2 + a^
3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d)*(((-b^6*d^4*(3*a^2 -
b^2)^2)^(1/2) - 3*a*b^4*d^2 + a^3*b^2*d^2)/d^4)^(1/2))/2)*(((6*a^2*b^8*d^4
- b^10*d^4 - 9*a^4*b^6*d^4)^(1/2) - 3*a*b^4*d^2 + a^3*b^2*d^2)/(4*d^4))^(1/
2) + log((((16*b^4*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2
- (16*a*b^2*(-((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) + 3*a*b^4*d^2 - a^3*b^2*d^2
)/d^4)^(1/2)*(a^2*b + b^3 + d*(-((-b^6*d^4*(3*a^2 - b^2)^2)^(1/2) + 3*a*b^4
*d^2 - a^3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d)*(-((-b^6*d^4
*(3*a^2 - b^2)^2)^(1/2) + 3*a*b^4*d^2 - a^3*b^2*d^2)/d^4)^(1/2))/2 + (8*b^5
*(a^2 - b^2)*(a^2 + b^2)^2)/d^3)*((a^3*b^2)/(4*d^2) - (3*a*b^4)/(4*d^2) - (
6*a^2*b^8*d^4 - b^10*d^4 - 9*a^4*b^6*d^4)^(1/2)/(4*d^4))^(1/2) - log(((-((-
a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + a^5*d^2 - 3*a^3*b^2*d^2)/d^4)^(1/2)*((
16*a^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 + (16*a*
b^2*(-((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + a^5*d^2 - 3*a^3*b^2*d^2)/d^4)
^(1/2)*(a^2*b + b^3 + d*(-((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + a^5*d^2 -
 3*a^3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/d))/2 - (16*a^4*b^3
*(a^2 + b^2)^2)/d^3)*(-((6*a^6*b^4*d^4 - a^4*b^6*d^4 - 9*a^8*b^2*d^4)^(1/2)
 + a^5*d^2 - 3*a^3*b^2*d^2)/(4*d^4))^(1/2) - log(((((-a^4*b^2*d^4*(3*a^2 -
b^2)^2)^(1/2) - a^5*d^2 + 3*a^3*b^2*d^2)/d^4)^(1/2)*((16*a^2*b^2*(a + b*cot
(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2*b^2))/d^2 + (16*a*b^2*(((-a^4*b^2*d^4*(
3*a^2 - b^2)^2)^(1/2) - a^5*d^2 + 3*a^3*b^2*d^2)/d^4)^(1/2)*(a^2*b + b^3 +
d*(((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - a^5*d^2 + 3*a^3*b^2*d^2)/d^4)^(1
/2)*(a + b*cot(c + d*x))^(1/2)))/d))/2 - (16*a^4*b^3*(a^2 + b^2)^2)/d^3)*((
(6*a^6*b^4*d^4 - a^4*b^6*d^4 - 9*a^8*b^2*d^4)^(1/2) - a^5*d^2 + 3*a^3*b^2*d
^2)/(4*d^4))^(1/2) + log(- ((((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) - a^5*d^
2 + 3*a^3*b^2*d^2)/d^4)^(1/2)*((16*a^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4
+ b^4 - 6*a^2*b^2))/d^2 - (16*a*b^2*(((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2)
- a^5*d^2 + 3*a^3*b^2*d^2)/d^4)^(1/2)*(a^2*b + b^3 - d*(((-a^4*b^2*d^4*(3*a
^2 - b^2)^2)^(1/2) - a^5*d^2 + 3*a^3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x
))^(1/2)))/d))/2 - (16*a^4*b^3*(a^2 + b^2)^2)/d^3)*((6*a^6*b^4*d^4 - a^4*b^
6*d^4 - 9*a^8*b^2*d^4)^(1/2)/(4*d^4) - a^5/(4*d^2) + (3*a^3*b^2)/(4*d^2))^(
1/2) + log(- ((-((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + a^5*d^2 - 3*a^3*b^2
*d^2)/d^4)^(1/2)*((16*a^2*b^2*(a + b*cot(c + d*x))^(1/2)*(a^4 + b^4 - 6*a^2
*b^2))/d^2 - (16*a*b^2*(-((-a^4*b^2*d^4*(3*a^2 - b^2)^2)^(1/2) + a^5*d^2 -
3*a^3*b^2*d^2)/d^4)^(1/2)*(a^2*b + b^3 - d*(-((-a^4*b^2*d^4*(3*a^2 - b^2)^2
)^(1/2) + a^5*d^2 - 3*a^3*b^2*d^2)/d^4)^(1/2)*(a + b*cot(c + d*x))^(1/2)))/
d))/2 - (16*a^4*b^3*(a^2 + b^2)^2)/d^3)*((3*a^3*b^2)/(4*d^2) - a^5/(4*d^2)
- (6*a^6*b^4*d^4 - a^4*b^6*d^4 - 9*a^8*b^2*d^4)^(1/2)/(4*d^4))^(1/2) - (2*b
*(a + b*cot(c + d*x))^(3/2))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int a^2\sqrt{a+b\cot(c+dx)}\,dx-\int\left(-b^2\sqrt{a+b\cot(c+dx)}\,\cot^2(c+dx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))**(3/2),x)
```

```
[Out] -Integral(a**2*sqrt(a + b*cot(c + d*x)), x) - Integral(-b**2*sqrt(a + b*cot
(c + d*x))*cot(c + d*x)**2, x)
```

3.100 $\int(-a+b\cot(c+dx))\sqrt{a+b\cot(c+dx)}\,dx$

Optimal. Leaf size=422

$$-\frac{b\sqrt{a^2+b^2}\log\left(-\sqrt{2}\sqrt{\sqrt{a^2+b^2}+a}\sqrt{a+b\cot(c+dx)}+\sqrt{a^2+b^2}+a+b\cot(c+dx)\right)}{2\sqrt{2}d\sqrt{\sqrt{a^2+b^2}+a}}+\frac{b\sqrt{a^2+b^2}\log\left(\sqrt{2}\right.}{}$$

```
[Out] -2*b*(a+b*cot(d*x+c))^(1/2)/d+1/2*b*arctanh((-2^(1/2)*(a+b*cot(d*x+c))^(1/2
)+(a+(a^2+b^2)^(1/2))^(1/2))/(a-(a^2+b^2)^(1/2))^(1/2))*(a^2+b^2)^(1/2)/d*2
^(1/2)/(a-(a^2+b^2)^(1/2))^(1/2)-1/2*b*arctanh((2^(1/2)*(a+b*cot(d*x+c))^(1
/2)+(a+(a^2+b^2)^(1/2))^(1/2))/(a-(a^2+b^2)^(1/2))^(1/2))*(a^2+b^2)^(1/2)/d
*2^(1/2)/(a-(a^2+b^2)^(1/2))^(1/2)-1/4*b*ln(a+b*cot(d*x+c)+(a^2+b^2)^(1/2)-
2^(1/2)*(a+b*cot(d*x+c))^(1/2)*(a+(a^2+b^2)^(1/2))^(1/2))*(a^2+b^2)^(1/2)/d
*2^(1/2)/(a+(a^2+b^2)^(1/2))^(1/2)+1/4*b*ln(a+b*cot(d*x+c)+(a^2+b^2)^(1/2)+
2^(1/2)*(a+b*cot(d*x+c))^(1/2)*(a+(a^2+b^2)^(1/2))^(1/2))*(a^2+b^2)^(1/2)/d
*2^(1/2)/(a+(a^2+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 0.42, antiderivative size = 422, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {3528, 12, 3485, 708, 1094, 634, 618, 206, 628}

$$-\frac{b\sqrt{a^2+b^2}\log\left(-\sqrt{2}\sqrt{\sqrt{a^2+b^2}+a}\sqrt{a+b\cot(c+dx)}+\sqrt{a^2+b^2}+a+b\cot(c+dx)\right)}{2\sqrt{2}d\sqrt{\sqrt{a^2+b^2}+a}}+\frac{b\sqrt{a^2+b^2}\log\left(\sqrt{2}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(-a + b*Cot[c + d*x])*Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] (b*Sqrt[a^2 + b^2]*ArcTanh[(Sqrt[a + Sqrt[a^2 + b^2]] - Sqrt[2]*Sqrt[a + b*
Cot[c + d*x]])/Sqrt[a - Sqrt[a^2 + b^2]]])/(Sqrt[2]*Sqrt[a - Sqrt[a^2 + b^2
]]*d) - (b*Sqrt[a^2 + b^2]*ArcTanh[(Sqrt[a + Sqrt[a^2 + b^2]] + Sqrt[2]*Sqr
t[a + b*Cot[c + d*x]])/Sqrt[a - Sqrt[a^2 + b^2]]])/(Sqrt[2]*Sqrt[a - Sqrt[a
^2 + b^2]]*d) - (2*b*Sqrt[a + b*Cot[c + d*x]])/d - (b*Sqrt[a^2 + b^2]*Log[a
 + Sqrt[a^2 + b^2] + b*Cot[c + d*x] - Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]]*Sqr
t[a + b*Cot[c + d*x]]])/(2*Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]]*d) + (b*Sqrt[a
^2 + b^2]*Log[a + Sqrt[a^2 + b^2] + b*Cot[c + d*x] + Sqrt[2]*Sqrt[a + Sqrt[
a^2 + b^2]]*Sqrt[a + b*Cot[c + d*x]]])/(2*Sqrt[2]*Sqrt[a + Sqrt[a^2 + b^2]]
*d)
```

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 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 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 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 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 708

```
Int[1/(Sqrt[(d_) + (e_.)*(x_)]*((a_) + (c_.)*(x_)^2)), x_Symbol] :> Dist[2*
e, Subst[Int[1/(c*d^2 + a*e^2 - 2*c*d*x^2 + c*x^4), x], x, Sqrt[d + e*x]],
x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0]
```

Rule 1094

```
Int[((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(-1), x_Symbol] :> With[{q = Rt[a/
c, 2]}, With[{r = Rt[2*q - b/c, 2]}, Dist[1/(2*c*q*r), Int[(r - x)/(q - r*x
 + x^2), x], x] + Dist[1/(2*c*q*r), Int[(r + x)/(q + r*x + x^2), x], x]]] /
; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && NegQ[b^2 - 4*a*c]
```

Rule 3485

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Dist[b/d, Sub
st[Int[(a + x)^n/(b^2 + x^2), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b, c,
```

```
 d, n}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3528

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

Rubi steps

$$\int (-a+b\cot(c+dx))\sqrt{a+b\cot(c+dx)}\,dx = -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}+\int \frac{-a^2-b^2}{\sqrt{a+b\cot(c+dx)}}\,dx$$

$$= -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}+\left(-a^2-b^2\right)\int \frac{1}{\sqrt{a+b\cot(c+dx)}}\,dx$$

$$= -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}+\frac{\left(b\left(a^2+b^2\right)\right)\text{Subst}\left(\int \frac{1}{\sqrt{a+x}\left(b^2+x^2\right)}\,dx,\right.}{d}$$

$$= -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}+\frac{\left(2b\left(a^2+b^2\right)\right)\text{Subst}\left(\int \frac{1}{a^2+b^2-2ax^2+x^4}\right.}{d}$$

$$= -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}+\frac{\left(b\sqrt{a^2+b^2}\right)\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{a+\sqrt{a^2}}}{\sqrt{a^2+b^2}-\sqrt{2}\sqrt{a+}}\right.}{\sqrt{2}\sqrt{a+}}$$

$$= -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}+\frac{\left(b\sqrt{a^2+b^2}\right)\text{Subst}\left(\int \frac{1}{\sqrt{a^2+b^2}-\sqrt{2}\sqrt{a+}}\right.}{2a}$$

$$= -\frac{2b\sqrt{a+b\cot(c+dx)}}{d}-\frac{b\sqrt{a^2+b^2}\log\left(a+\sqrt{a^2+b^2}+b\cot(\right.}{2\sqrt{2}}$$

$$= \frac{b\sqrt{a^2+b^2}\tanh^{-1}\left(\frac{\sqrt{a+\sqrt{a^2+b^2}}-\sqrt{2}\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{a^2+b^2}}}\right)}{\sqrt{2}\sqrt{a-\sqrt{a^2+b^2}}\,d}-\frac{b\sqrt{a^2+b^2}\,\text{ta}}{}$$

Mathematica [C] time = 1.06, size = 158, normalized size = 0.37

$$\frac{\sin(c+dx)(b\cot(c+dx)-a)\left(\frac{i(a^2+b^2)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{\sqrt{a-ib}}-\frac{i(a^2+b^2)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{\sqrt{a+ib}}+2b\sqrt{a+b\cot(c+dx)}\right)}{d(a\sin(c+dx)-b\cos(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-a + b*Cot[c + d*x])*Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] ((-a + b*Cot[c + d*x])*((I*(a^2 + b^2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqr
t[a - I*b]])/Sqrt[a - I*b] - (I*(a^2 + b^2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]
]/Sqrt[a + I*b]])/Sqrt[a + I*b] + 2*b*Sqrt[a + b*Cot[c + d*x]])*Sin[c + d*x
])/(d*(-(b*Cos[c + d*x]) + a*Sin[c + d*x]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{b\cot(dx+c)+a}\,(b\cot(dx+c)-a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*cot(d*x + c) + a)*(b*cot(d*x + c) - a), x)
```

maple [B] time = 0.54, size = 2285, normalized size = 5.41

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(1/2),x)
```

```
[Out] 1/d*b^3/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^
(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-2
/d*b^5/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(
```

```
1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-1/
d*b^3/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+
c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))+2/d
*b^5/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c
))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-1/4/
d*b^3/(a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*c
ot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+1/4/d*b^3/(a^2+b
^2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+
(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*b*(a+b*cot(d*x+c))^(1/2)/d
+1/d/b/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x
+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^
6+4/d*b/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*
x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a
^4-2/d*b/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d
*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*
a^2-1/4/d/b/(a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/
2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4+1/4/d/
b/(a^2+b^2)^(3/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b
*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^5-1/2/d*b/(a
^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c
)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2+2/d*b/(a^2+b^2)^(1/2
)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+
b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2-1/d/b/(a^2+b^2)^(3/
2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a
+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^6-5/d*b^3/(a^2+b^2)^
(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2
*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2-1/2/d*b/(a^2+b^
2)^(3/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(
1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3-1/d/b/(a^2+b^2)^(1/
2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b
^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4-1/4/d*b^3/(a^2+b^2
)^(3/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-1/4/d/b/(a^2+b^2)^(3/2
)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a
^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^5+1/4/d/b/(a^2+b^2)*ln(b*cot
(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1
/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4+1/2/d*b/(a^2+b^2)*ln(b*cot(d*x+c)+a+
(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a
^2+b^2)^(1/2)+2*a)^(1/2)*a^2+1/d/b/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^
(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a
^2+b^2)^(1/2)-2*a)^(1/2))*a^4+5/d*b^3/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*
a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2
*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2-4/d*b/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2
*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(
2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4+1/2/d*b/(a^2+b^2)^(3/2)*ln((a+b*cot(d*x+c
```

```
))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(
a^2+b^2)^(1/2)+2*a)^(1/2)*a^3+1/4/d*b^3/(a^2+b^2)^(3/2)*ln((a+b*cot(d*x+c))
^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^
2+b^2)^(1/2)+2*a)^(1/2)*a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{b\cot(dx+c)+a}\,(b\cot(dx+c)-a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*cot(d*x + c) + a)*(b*cot(d*x + c) - a), x)
```

mupad [B] time = 2.57, size = 583, normalized size = 1.38

$$-\operatorname{atanh}\left(\frac{d^3\left(\frac{16\left(a^2b^4-a^4b^2\right)\sqrt{a+b\cot(c+d\,x)}}{d^2}+\frac{16\,a\,b^2\left(a^3+1\mathrm{i}\,b\,a^2\right)\sqrt{a+b\cot(c+d\,x)}}{d^2}\right)\sqrt{-\frac{a^3+1\mathrm{i}\,b\,a^2}{d^2}}}{16\left(a^5b^3+a^3b^5\right)}\right)\sqrt{-\frac{a^3+1\mathrm{i}\,b\,a^2}{d^2}}-\operatorname{atanh}\left(\frac{d^3}{\ldots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a + b*cot(c + d*x))^(1/2)*(a - b*cot(c + d*x)),x)
```

```
[Out] atan((b^6*((a*b^2)/(4*d^2) - (b^3*1i)/(4*d^2))^(1/2)*(a + b*cot(c + d*x))^(
1/2)*32i)/((b^8*16i)/d + (a^2*b^6*16i)/d) + (32*a*b^5*((a*b^2)/(4*d^2) - (b
^3*1i)/(4*d^2))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((b^8*16i)/d + (a^2*b^6*1
6i)/d))*((a*b^2 - b^3*1i)/(4*d^2))^(1/2)*2i - atan((b^6*((b^3*1i)/(4*d^2) +
 (a*b^2)/(4*d^2))^(1/2)*(a + b*cot(c + d*x))^(1/2)*32i)/((b^8*16i)/d + (a^2
*b^6*16i)/d) - (32*a*b^5*((b^3*1i)/(4*d^2) + (a*b^2)/(4*d^2))^(1/2)*(a + b*
cot(c + d*x))^(1/2))/((b^8*16i)/d + (a^2*b^6*16i)/d))*((a*b^2 + b^3*1i)/(4*
d^2))^(1/2)*2i - atanh((d^3*((16*(a^2*b^4 - a^4*b^2)*(a + b*cot(c + d*x))^(
1/2))/d^2 + (16*a*b^2*(a^2*b*1i + a^3)*(a + b*cot(c + d*x))^(1/2))/d^2)*(-(
a^2*b*1i + a^3)/d^2)^(1/2))/(16*(a^3*b^5 + a^5*b^3)))*(-(a^2*b*1i + a^3)/d^
2)^(1/2) - atanh((d^3*((a^2*b*1i - a^3)/d^2)^(1/2)*((16*(a^2*b^4 - a^4*b^2)
*(a + b*cot(c + d*x))^(1/2))/d^2 - (16*a*b^2*(a^2*b*1i - a^3)*(a + b*cot(c
+ d*x))^(1/2))/d^2))/(16*(a^3*b^5 + a^5*b^3)))*((a^2*b*1i - a^3)/d^2)^(1/2)
 - (2*b*(a + b*cot(c + d*x))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int a\sqrt{a+b\cot(c+dx)}\,dx-\int\left(-b\sqrt{a+b\cot(c+dx)}\cot(c+dx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))*(a+b*cot(d*x+c))**(1/2),x)
```

```
[Out] -Integral(a*sqrt(a + b*cot(c + d*x)), x) - Integral(-b*sqrt(a + b*cot(c + d
*x))*cot(c + d*x), x)
```

3.101 $\int \frac{A+B\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx$

Optimal. Leaf size=102

$$\frac{(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}-\frac{(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}$$

```
[Out] (I*A+B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/d/(a-I*b)^(1/2)-(I*A-
B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/d/(a+I*b)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3539, 3537, 63, 208}

$$\frac{(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}-\frac{(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] ((I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/(Sqrt[a - I*b]*
d) - ((I*A - B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/(Sqrt[a +
I*b]*d)
```

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]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
```

```
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{A+B\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx &= \frac{1}{2}(A-iB)\int \frac{1+i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx+\frac{1}{2}(A+iB)\int \frac{1-i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx \\
&= \frac{(iA-B)\,\text{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a+ibx}}\,dx,x,-i\cot(c+dx)\right)}{2d}-\frac{(iA+B)\,\text{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a-i}}\right.}{2d} \\
&= \frac{(A-iB)\,\text{Subst}\left(\int \frac{1}{-1-\frac{ia}{b}+\frac{ix^2}{b}}\,dx,x,\sqrt{a+b\cot(c+dx)}\right)}{bd}+\frac{(A+iB)\,\text{Subst}\left(\int \frac{1}{-1+\frac{ia}{b}-}\right.}{} \\
&= \frac{(iA+B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{\sqrt{a-ib}\,d}-\frac{(iA-B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{\sqrt{a+ib}\,d}
\end{aligned}$$

Mathematica [A] time = 0.61, size = 154, normalized size = 1.51

$$\frac{\sin(c+dx)(A+B\cot(c+dx))\left(\sqrt{a+ib}\,(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)+\sqrt{a-ib}\,(B-iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right.\right.}{d\sqrt{a-ib}\,\sqrt{a+ib}\,(A\sin(c+dx)+B\cos(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] ((Sqrt[a + I*b]*(I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]] +
 Sqrt[a - I*b]*((-I)*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]]
)*(A + B*Cot[c + d*x])*Sin[c + d*x])/(Sqrt[a - I*b]*Sqrt[a + I*b]*d*(B*Cos[
c + d*x] + A*Sin[c + d*x]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\cot(dx+c)+A}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((B*cot(d*x + c) + A)/sqrt(b*cot(d*x + c) + a), x)
```

maple [B] time = 0.49, size = 3976, normalized size = 38.98

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x)
```

```
[Out] -1/d/(a^2+b^2)/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))
^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^4-
1/4/d/(a^2+b^2)/b^2*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)
-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3-1/4/d/
(a^2+b^2)^(3/2)*b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b
*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a+1/d/(a^2+b
^2)^(1/2)/b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+
(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A*a^2+1/d/(a^
2+b^2)^(3/2)/b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a
)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A*a^4-1/4/
d/(a^2+b^2)^(3/2)/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)
-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3-3/d/(a
^2+b^2)^(3/2)*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1
/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2*A+1/d
/(a^2+b^2)^(3/2)*b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c
))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a*B-
1/d/(a^2+b^2)^(1/2)/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*
x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B
*a^3-1/d/(a^2+b^2)^(1/2)/b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^
2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)
)*A*a^2-1/d/(a^2+b^2)^(3/2)*b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a
^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^
```

(1/2))*a*B+1/4/d/(a^2+b^2)/b^2*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3+1/d/(a^2+b^2)^(1/2)/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^3-1/4/d/(a^2+b^2)/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2-1/d*(a^2+b^2)^(1/2)/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a+3/d/(a^2+b^2)^(3/2)*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2*A-1/d/(a^2+b^2)^(3/2)/b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A*a^4+1/d/(a^2+b^2)/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^4+1/d*(a^2+b^2)^(1/2)/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a+1/4/d/(a^2+b^2)^(3/2)/b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3+1/4/d/(a^2+b^2)^(3/2)*b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a+1/4/d/(a^2+b^2)/b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2-2/d/(a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^2+2/d/(a^2+b^2)^(3/2)*b^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A-1/d/(a^2+b^2)*b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B-1/d/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3*B+1/4/d/(a^2+b^2)*b*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+1/d/b^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^2+2/d/(a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^2-1/4/d/(a^2+b^2)*b*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*A*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+1/4/d/(a^2+b^2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a+1/4/d/(a^2+b^2)^(3/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2-1/4/d/(a^2+b^2)^(3/2)*b^2*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+1/d/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))

```
*B*a-1/4/d/(a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2
)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a+1/d/(a^
2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)
+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3*B-1/4/d/
b^2*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+
(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-1/d/b^2/(2*(a^2+b^2)^(1/
2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2
))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a^2+1/d/(a^2+b^2)*b^2/(2*(a^2+b^2)^(1/2
)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2)
)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B-1/d/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2
*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(
2*(a^2+b^2)^(1/2)-2*a)^(1/2))*B*a-2/d/(a^2+b^2)^(3/2)*b^3/(2*(a^2+b^2)^(1/2
)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2)
)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*A+1/4/d/b^2*ln((a+b*cot(d*x+c))^(1/2)*(2*(
a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1
/2)+2*a)^(1/2)*a-1/4/d/(a^2+b^2)^(3/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^
2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*
a)^(1/2)*a^2+1/d/(a^2+b^2)^(1/2)*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*
(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*
a)^(1/2))*A-1/d/(a^2+b^2)^(1/2)*b/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*
(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a
)^(1/2))*A+1/4/d/(a^2+b^2)^(3/2)*b^2*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/
2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*B*(2*(a^2+b^2)^(1/2)+2*a)
^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\cot(dx+c)+A}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cot(d*x + c) + A)/sqrt(b*cot(d*x + c) + a), x)
```

mupad [B] time = 2.29, size = 2909, normalized size = 28.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))/(a + b*cot(c + d*x))^(1/2),x)
```

```
[Out] 2*atanh((32*B^2*b^2*((B^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)) - (-16*B^4*b^2*d^4
)^(1/2)/(16*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*B^
```

```
3*b^2)/d - (16*B^3*a^2*b^2*d^3)/(a^2*d^4 + b^2*d^4) + (4*B*a*b^2*d^2*(-16*B
^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) + (8*a*b^2*((B^2*a*d^2)/(4*(a^2*d^4
 + b^2*d^4)) - (-16*B^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)))^(1/2)*(a +
 b*cot(c + d*x))^(1/2)*(-16*B^4*b^2*d^4)^(1/2))/(16*B^3*b^4*d + 16*B^3*a^2*
b^2*d - (16*B^3*a^2*b^4*d^5)/(a^2*d^4 + b^2*d^4) - (16*B^3*a^4*b^2*d^5)/(a^
2*d^4 + b^2*d^4) + (4*B*a^3*b^2*d^4*(-16*B^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2
*d^5) + (4*B*a*b^4*d^4*(-16*B^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) - (32*
B^2*a^2*b^2*d^2*((B^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)) - (-16*B^4*b^2*d^4)^(1
/2)/(16*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/(16*B^3*b^4
*d + 16*B^3*a^2*b^2*d - (16*B^3*a^2*b^4*d^5)/(a^2*d^4 + b^2*d^4) - (16*B^3*
a^4*b^2*d^5)/(a^2*d^4 + b^2*d^4) + (4*B*a^3*b^2*d^4*(-16*B^4*b^2*d^4)^(1/2)
)/(a^2*d^5 + b^2*d^5) + (4*B*a*b^4*d^4*(-16*B^4*b^2*d^4)^(1/2))/(a^2*d^5 +
b^2*d^5)))*((B^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)) - (-16*B^4*b^2*d^4)^(1/2)/(
16*(a^2*d^4 + b^2*d^4)))^(1/2) + 2*atanh((8*a*b^2*((-16*B^4*b^2*d^4)^(1/2)/
(16*(a^2*d^4 + b^2*d^4)) + (B^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a +
b*cot(c + d*x))^(1/2)*(-16*B^4*b^2*d^4)^(1/2))/((16*B^3*a^2*b^4*d^5)/(a^2*d
^4 + b^2*d^4) - 16*B^3*a^2*b^2*d - 16*B^3*b^4*d + (16*B^3*a^4*b^2*d^5)/(a^2
*d^4 + b^2*d^4) + (4*B*a^3*b^2*d^4*(-16*B^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*
d^5) + (4*B*a*b^4*d^4*(-16*B^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) - (32*B
^2*b^2*((-16*B^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) + (B^2*a*d^2)/(4*(
a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*B^3*a^2*b^2*d^3
)/(a^2*d^4 + b^2*d^4) - (16*B^3*b^2)/d + (4*B*a*b^2*d^2*(-16*B^4*b^2*d^4)^(
1/2))/(a^2*d^5 + b^2*d^5)) + (32*B^2*a^2*b^2*d^2*((-16*B^4*b^2*d^4)^(1/2)/(
16*(a^2*d^4 + b^2*d^4)) + (B^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b
*cot(c + d*x))^(1/2))/((16*B^3*a^2*b^4*d^5)/(a^2*d^4 + b^2*d^4) - 16*B^3*a^
2*b^2*d - 16*B^3*b^4*d + (16*B^3*a^4*b^2*d^5)/(a^2*d^4 + b^2*d^4) + (4*B*a^
3*b^2*d^4*(-16*B^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (4*B*a*b^4*d^4*(-1
6*B^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)))*((-16*B^4*b^2*d^4)^(1/2)/(16*(a
^2*d^4 + b^2*d^4)) + (B^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2) + 2*atanh((
32*A^2*b^2*((-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (A^2*a*d^2)/
(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*A^3*a*b^3*d
^3)/(a^2*d^4 + b^2*d^4) - (4*A*b^3*d^2*(-16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 +
b^2*d^5)) + (8*a*b^2*((-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (A
^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(-16*A^
4*b^2*d^4)^(1/2))/((16*A^3*a*b^5*d^5)/(a^2*d^4 + b^2*d^4) - (4*A*b^5*d^4*(-
16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (16*A^3*a^3*b^3*d^5)/(a^2*d^4
+ b^2*d^4) - (4*A*a^2*b^3*d^4*(-16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5))
 - (32*A^2*a^2*b^2*d^2*((-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) -
(A^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16
*A^3*a*b^5*d^5)/(a^2*d^4 + b^2*d^4) - (4*A*b^5*d^4*(-16*A^4*b^2*d^4)^(1/2))
/(a^2*d^5 + b^2*d^5) + (16*A^3*a^3*b^3*d^5)/(a^2*d^4 + b^2*d^4) - (4*A*a^2*
b^3*d^4*(-16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)))*((-16*A^4*b^2*d^4)^(
1/2)/(16*(a^2*d^4 + b^2*d^4)) - (A^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)
- 2*atanh((8*a*b^2*(- (-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (A
^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(-16*A^
```

```
4*b^2*d^4)^(1/2))/((16*A^3*a*b^5*d^5)/(a^2*d^4 + b^2*d^4) + (4*A*b^5*d^4*(-
16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (16*A^3*a^3*b^3*d^5)/(a^2*d^4
+ b^2*d^4) + (4*A*a^2*b^3*d^4*(-16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5))
 - (32*A^2*b^2*(- (-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (A^2*a
*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*A^3*a
*b^3*d^3)/(a^2*d^4 + b^2*d^4) + (4*A*b^3*d^2*(-16*A^4*b^2*d^4)^(1/2))/(a^2*
d^5 + b^2*d^5)) + (32*A^2*a^2*b^2*d^2*(- (-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d
^4 + b^2*d^4)) - (A^2*a*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c +
d*x))^(1/2))/((16*A^3*a*b^5*d^5)/(a^2*d^4 + b^2*d^4) + (4*A*b^5*d^4*(-16*A^
4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (16*A^3*a^3*b^3*d^5)/(a^2*d^4 + b^2
*d^4) + (4*A*a^2*b^3*d^4*(-16*A^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)))*(-
(-16*A^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (A^2*a*d^2)/(4*(a^2*d^4
+ b^2*d^4)))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A + B\cot(c + dx)}{\sqrt{a + b\cot(c + dx)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))**(1/2),x)
```

```
[Out] Integral((A + B*cot(c + d*x))/sqrt(a + b*cot(c + d*x)), x)
```

3.102 $\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=138

$$\frac{2(Ab-aB)}{d\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}+\frac{(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{3/2}}-\frac{(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d(a+ib)^{3/2}}$$

```
[Out] (I*A+B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/(a-I*b)^(3/2)/d-(I*A-
B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/(a+I*b)^(3/2)/d+2*(A*b-B*a
)/(a^2+b^2)/d/(a+b*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.26, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3529, 3539, 3537, 63, 208}

$$\frac{2(Ab-aB)}{d\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}+\frac{(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{3/2}}-\frac{(-B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d(a+ib)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^(3/2),x]
```

```
[Out] ((I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/((a - I*b)^(3/2
)*d) - ((I*A - B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/((a + I*
b)^(3/2)*d) + (2*(A*b - a*B))/((a^2 + b^2)*d*Sqrt[a + b*Cot[c + d*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 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 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
```

```
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^{3/2}}\,dx = \frac{2(Ab-aB)}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}} + \frac{\int \frac{aA+bB-(Ab-aB)\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx}{a^2+b^2}$$

$$= \frac{2(Ab-aB)}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}} + \frac{(A-iB)\int \frac{1+i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx}{2(a-ib)} + \frac{(A+iB)\int \frac{1-i\cot(c\cdots}{\sqrt{a+b\cot(\cdots}}}{2(a+ib)}$$

$$= \frac{2(Ab-aB)}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}} + \frac{(i(A+iB))\,\mathrm{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a+ibx}}\,dx, x, -i\cot(c+\cdots\right.}{2(a+ib)d}$$

$$= \frac{2(Ab-aB)}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}} + \frac{(A-iB)\,\mathrm{Subst}\left(\int \frac{1}{-1-\frac{ia}{b}+\frac{ix^2}{b}}\,dx, x, \sqrt{a+b\cot(c+\cdots}\right.}{(a-ib)bd}$$

$$= \frac{(iA+B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{(a-ib)^{3/2}d} - \frac{(iA-B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{(a+ib)^{3/2}d} + \frac{2(A\cdots}{\left(a^2+b^2\right)d\sqrt{\cdots}}$$

Mathematica [A] time = 1.67, size = 226, normalized size = 1.64

$$-\frac{\frac{\left(aAb-a\sqrt{-b^2}\,B+A\sqrt{-b^2}\,b+b^2B\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{-b^2}}}\right)}{\sqrt{-b^2}\,\sqrt{a-\sqrt{-b^2}}}-\frac{\left(aAb+a\sqrt{-b^2}\,B-A\sqrt{-b^2}\,b+b^2B\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+\sqrt{-b^2}}}\right)}{\sqrt{-b^2}\,\sqrt{a+\sqrt{-b^2}}}+\frac{2(aB-Ab)}{\sqrt{a+b\cot(c+dx)}}}{d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^(3/2),x]
```

```
[Out] -((((a*A*b + A*b*Sqrt[-b^2] + b^2*B - a*Sqrt[-b^2]*B)*ArcTanh[Sqrt[a + b*Co
t[c + d*x]]/Sqrt[a - Sqrt[-b^2]]])/(Sqrt[-b^2]*Sqrt[a - Sqrt[-b^2]]) - ((a*
A*b - A*b*Sqrt[-b^2] + b^2*B + a*Sqrt[-b^2]*B)*ArcTanh[Sqrt[a + b*Cot[c + d
*x]]/Sqrt[a + Sqrt[-b^2]]])/(Sqrt[-b^2]*Sqrt[a + Sqrt[-b^2]]) + (2*(-(A*b)
+ a*B))/Sqrt[a + b*Cot[c + d*x]])/((a^2 + b^2)*d))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\cot\left(dx+c\right)+A}{\left(b\cot\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((B*cot(d*x + c) + A)/(b*cot(d*x + c) + a)^(3/2), x)
```

maple [B] time = 0.46, size = 7951, normalized size = 57.62

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\cot(dx+c)+A}{(b\cot(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((B*cot(d*x + c) + A)/(b*cot(d*x + c) + a)^(3/2), x)
```

mupad [B] time = 6.47, size = 5737, normalized size = 41.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))/(a + b*cot(c + d*x))^(3/2),x)
```

```
[Out] (log((((a + b*cot(c + d*x))^(1/2)*(16*A^2*b^10*d^3 + 32*A^2*a^2*b^8*d^3 - 3
2*A^2*a^6*b^4*d^3 - 16*A^2*a^8*b^2*d^3) + ((((96*A^4*a^2*b^4*d^4 - 16*A^4*b
^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) - 4*A^2*a^3*d^2 + 12*A^2*a*b^2*d^2)/(a^
6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(64*A*a*b^11*d^4 -
((((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) - 4*A^
2*a^3*d^2 + 12*A^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^
2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5
+ 640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5))/4
 + 256*A*a^3*b^9*d^4 + 384*A*a^5*b^7*d^4 + 256*A*a^7*b^5*d^4 + 64*A*a^9*b^3
*d^4))/4)*(((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/
2) - 4*A^2*a^3*d^2 + 12*A^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 +
 3*a^4*b^2*d^4))^(1/2))/4 - 8*A^3*b^9*d^2 - 24*A^3*a^2*b^7*d^2 - 24*A^3*a^4
*b^5*d^2 - 8*A^3*a^6*b^3*d^2)*(((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*
A^4*a^4*b^2*d^4)^(1/2) - 4*A^2*a^3*d^2 + 12*A^2*a*b^2*d^2)/(a^6*d^4 + b^6*d
^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))/4 + (log((((a + b*cot(c + d*x))
^(1/2)*(16*A^2*b^10*d^3 + 32*A^2*a^2*b^8*d^3 - 32*A^2*a^6*b^4*d^3 - 16*A^2*
a^8*b^2*d^3) + ((-((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d
^4)^(1/2) + 4*A^2*a^3*d^2 - 12*A^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^
4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(64*A*a*b^11*d^4 - ((-((96*A^4*a^2*b^4*d^4 -
16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) + 4*A^2*a^3*d^2 - 12*A^2*a*b^2*
d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(a + b*cot(
c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 640*a
^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5))/4 + 256*A*a^3*b^9*d^4 + 38
4*A*a^5*b^7*d^4 + 256*A*a^7*b^5*d^4 + 64*A*a^9*b^3*d^4))/4)*(-((96*A^4*a^2*
b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) + 4*A^2*a^3*d^2 - 12*
A^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))/
4 - 8*A^3*b^9*d^2 - 24*A^3*a^2*b^7*d^2 - 24*A^3*a^4*b^5*d^2 - 8*A^3*a^6*b^3
```

```
*d^2)*(-((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2)
+ 4*A^2*a^3*d^2 - 12*A^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*
a^4*b^2*d^4))^(1/2))/4 - log(- ((a + b*cot(c + d*x))^(1/2)*(16*A^2*b^10*d^3
 + 32*A^2*a^2*b^8*d^3 - 32*A^2*a^6*b^4*d^3 - 16*A^2*a^8*b^2*d^3) - (((96*A^
4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) - 4*A^2*a^3*d^2
 + 12*A^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2
*d^4))^(1/2)*((((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)
^(1/2) - 4*A^2*a^3*d^2 + 12*A^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^
2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^
5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5
+ 64*a^11*b^2*d^5) + 64*A*a*b^11*d^4 + 256*A*a^3*b^9*d^4 + 384*A*a^5*b^7*d^
4 + 256*A*a^7*b^5*d^4 + 64*A*a^9*b^3*d^4))*(((96*A^4*a^2*b^4*d^4 - 16*A^4*b
^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) - 4*A^2*a^3*d^2 + 12*A^2*a*b^2*d^2)/(16
*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - 8*A^3*b^9
*d^2 - 24*A^3*a^2*b^7*d^2 - 24*A^3*a^4*b^5*d^2 - 8*A^3*a^6*b^3*d^2)*(((96*A
^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) - 4*A^2*a^3*d^
2 + 12*A^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^
2*d^4))^(1/2) - log(- ((a + b*cot(c + d*x))^(1/2)*(16*A^2*b^10*d^3 + 32*A^2
*a^2*b^8*d^3 - 32*A^2*a^6*b^4*d^3 - 16*A^2*a^8*b^2*d^3) - (-((96*A^4*a^2*b^
4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) + 4*A^2*a^3*d^2 - 12*A^
2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(
1/2)*((-((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2)
+ 4*A^2*a^3*d^2 - 12*A^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d
^4 + 48*a^4*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320
*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^
11*b^2*d^5) + 64*A*a*b^11*d^4 + 256*A*a^3*b^9*d^4 + 384*A*a^5*b^7*d^4 + 256
*A*a^7*b^5*d^4 + 64*A*a^9*b^3*d^4))*(-((96*A^4*a^2*b^4*d^4 - 16*A^4*b^6*d^4
 - 144*A^4*a^4*b^2*d^4)^(1/2) + 4*A^2*a^3*d^2 - 12*A^2*a*b^2*d^2)/(16*a^6*d
^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - 8*A^3*b^9*d^2 -
 24*A^3*a^2*b^7*d^2 - 24*A^3*a^4*b^5*d^2 - 8*A^3*a^6*b^3*d^2)*(-((96*A^4*a^
2*b^4*d^4 - 16*A^4*b^6*d^4 - 144*A^4*a^4*b^2*d^4)^(1/2) + 4*A^2*a^3*d^2 - 1
2*A^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4
))^(1/2) + (log(24*B^3*a^3*b^6*d^2 - ((((96*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^
4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^2*a^3*d^2 - 12*B^2*a*b^2*d^2)/(a^6*d^4
 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(((((96*B^4*a^2*b^4*d^4
- 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^2*a^3*d^2 - 12*B^2*a*b^
2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(((((96*B
^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^2*a^3*d^
2 - 12*B^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^
(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^
5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5))/4 - 32*B*
b^12*d^4 - 96*B*a^2*b^10*d^4 - 64*B*a^4*b^8*d^4 + 64*B*a^6*b^6*d^4 + 96*B*a
^8*b^4*d^4 + 32*B*a^10*b^2*d^4))/4 + (a + b*cot(c + d*x))^(1/2)*(16*B^2*b^1
0*d^3 + 32*B^2*a^2*b^8*d^3 - 32*B^2*a^6*b^4*d^3 - 16*B^2*a^8*b^2*d^3)))/4 +
 24*B^3*a^5*b^4*d^2 + 8*B^3*a^7*b^2*d^2 + 8*B^3*a*b^8*d^2)*(((96*B^4*a^2*b^
```

4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^2*a^3*d^2 - 12*B^
2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))/4
+ (log(24*B^3*a^3*b^6*d^2 - ((-((96*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*
B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3*d^2 + 12*B^2*a*b^2*d^2)/(a^6*d^4 + b^6*d
^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(((-((96*B^4*a^2*b^4*d^4 - 16*B^
4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3*d^2 + 12*B^2*a*b^2*d^2)/
(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(((-((96*B^4*a^2
*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3*d^2 + 12
*B^2*a*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*
(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*
d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5))/4 - 32*B*b^12*d
^4 - 96*B*a^2*b^10*d^4 - 64*B*a^4*b^8*d^4 + 64*B*a^6*b^6*d^4 + 96*B*a^8*b^4
*d^4 + 32*B*a^10*b^2*d^4))/4 + (a + b*cot(c + d*x))^(1/2)*(16*B^2*b^10*d^3
+ 32*B^2*a^2*b^8*d^3 - 32*B^2*a^6*b^4*d^3 - 16*B^2*a^8*b^2*d^3)))/4 + 24*B^
3*a^5*b^4*d^2 + 8*B^3*a^7*b^2*d^2 + 8*B^3*a*b^8*d^2)*(-((96*B^4*a^2*b^4*d^4
 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3*d^2 + 12*B^2*a*b
^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))/4 - log
((((96*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^
2*a^3*d^2 - 12*B^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 4
8*a^4*b^2*d^4))^(1/2)*((((96*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4
*b^2*d^4)^(1/2) + 4*B^2*a^3*d^2 - 12*B^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^
4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(32*B*b^12*d^4 + (((96*B^4*a^2*
b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^2*a^3*d^2 - 12*
B^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))
^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a
^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5) + 96*B*a^
2*b^10*d^4 + 64*B*a^4*b^8*d^4 - 64*B*a^6*b^6*d^4 - 96*B*a^8*b^4*d^4 - 32*B*
a^10*b^2*d^4) + (a + b*cot(c + d*x))^(1/2)*(16*B^2*b^10*d^3 + 32*B^2*a^2*b^
8*d^3 - 32*B^2*a^6*b^4*d^3 - 16*B^2*a^8*b^2*d^3)) + 24*B^3*a^3*b^6*d^2 + 24
*B^3*a^5*b^4*d^2 + 8*B^3*a^7*b^2*d^2 + 8*B^3*a*b^8*d^2)*(((96*B^4*a^2*b^4*d
^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) + 4*B^2*a^3*d^2 - 12*B^2*a
*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2
) - log((-((96*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2
) - 4*B^2*a^3*d^2 + 12*B^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4
*d^4 + 48*a^4*b^2*d^4))^(1/2)*((-((96*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 14
4*B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3*d^2 + 12*B^2*a*b^2*d^2)/(16*a^6*d^4 +
16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(32*B*b^12*d^4 + (-((9
6*B^4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3
*d^2 + 12*B^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4
*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d
^5 + 640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5)
 + 96*B*a^2*b^10*d^4 + 64*B*a^4*b^8*d^4 - 64*B*a^6*b^6*d^4 - 96*B*a^8*b^4*d
^4 - 32*B*a^10*b^2*d^4) + (a + b*cot(c + d*x))^(1/2)*(16*B^2*b^10*d^3 + 32*
B^2*a^2*b^8*d^3 - 32*B^2*a^6*b^4*d^3 - 16*B^2*a^8*b^2*d^3)) + 24*B^3*a^3*b^
6*d^2 + 24*B^3*a^5*b^4*d^2 + 8*B^3*a^7*b^2*d^2 + 8*B^3*a*b^8*d^2)*(-((96*B^

```
4*a^2*b^4*d^4 - 16*B^4*b^6*d^4 - 144*B^4*a^4*b^2*d^4)^(1/2) - 4*B^2*a^3*d^2
 + 12*B^2*a*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2
*d^4))^(1/2) + (2*A*b)/(d*(a^2 + b^2)*(a + b*cot(c + d*x))^(1/2)) - (2*B*a)
/(d*(a^2 + b^2)*(a + b*cot(c + d*x))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A + B \cot (c + dx)}{(a + b \cot (c + dx))^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))**(3/2),x)
```

```
[Out] Integral((A + B*cot(c + d*x))/(a + b*cot(c + d*x))**(3/2), x)
```

3.103 $\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=185

$$\frac{2(Ab-aB)}{3d\left(a^2+b^2\right)(a+b\cot(c+dx))^{3/2}}+\frac{2\left(a^2(-B)+2aAb+b^2B\right)}{d\left(a^2+b^2\right)^2\sqrt{a+b\cot(c+dx)}}+\frac{(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{5/2}}-\frac{(-B+iA)}{}$$

```
[Out] (I*A+B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/(a-I*b)^(5/2)/d-(I*A-
B)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/(a+I*b)^(5/2)/d+2/3*(A*b-B
*a)/(a^2+b^2)/d/(a+b*cot(d*x+c))^(3/2)+2*(2*A*a*b-B*a^2+B*b^2)/(a^2+b^2)^2/
d/(a+b*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.40, antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3529, 3539, 3537, 63, 208}

$$\frac{2(Ab-aB)}{3d\left(a^2+b^2\right)(a+b\cot(c+dx))^{3/2}}+\frac{2\left(a^2(-B)+2aAb+b^2B\right)}{d\left(a^2+b^2\right)^2\sqrt{a+b\cot(c+dx)}}+\frac{(B+iA)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{5/2}}-\frac{(-B+iA)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^(5/2),x]
```

```
[Out] ((I*A + B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/((a - I*b)^(5/2
)*d) - ((I*A - B)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/((a + I*
b)^(5/2)*d) + (2*(A*b - a*B))/(3*(a^2 + b^2)*d*(a + b*Cot[c + d*x])^(3/2))
+ (2*(2*a*A*b - a^2*B + b^2*B))/((a^2 + b^2)^2*d*Sqrt[a + b*Cot[c + d*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 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 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{A+B\cot(c+dx)}{(a+b\cot(c+dx))^{5/2}}\,dx = \frac{2(Ab-aB)}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} + \frac{\int \frac{aA+bB-(Ab-aB)\cot(c+dx)}{(a+b\cot(c+dx))^{3/2}}\,dx}{a^2+b^2}$$

$$= \frac{2(Ab-aB)}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} + \frac{2\left(2aAb-a^2B+b^2B\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} + \frac{\int \frac{a^2A-Ab^2+2\ldots}{\ldots}}{\ldots}$$

$$= \frac{2(Ab-aB)}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} + \frac{2\left(2aAb-a^2B+b^2B\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} + \frac{(A-iB)\int \ldots}{2(a\ldots}$$

$$= \frac{2(Ab-aB)}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} + \frac{2\left(2aAb-a^2B+b^2B\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} + \frac{(iA-B)\,\mathrm{Su}\ldots}{\ldots}$$

$$= \frac{2(Ab-aB)}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} + \frac{2\left(2aAb-a^2B+b^2B\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} - \frac{(A-iB)\,\mathrm{Su}\ldots}{\ldots}$$

$$= \frac{(iA+B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{(a-ib)^{5/2}d} - \frac{(iA-B)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{(a+ib)^{5/2}d} + \frac{2(\ldots}{3\left(a^2+b^2\right)d(\ldots}$$

Mathematica [A] time = 3.53, size = 319, normalized size = 1.72

$$-\frac{\frac{2\left(a^2+b^2\right)(aB-Ab)}{(a+b\cot(c+dx))^{3/2}} + \frac{6\left(a^2B-2aAb-b^2B\right)}{\sqrt{a+b\cot(c+dx)}} + \frac{3\left(a^2\left(Ab-\sqrt{-b^2}\,B\right)+2ab\left(A\sqrt{-b^2}+bB\right)+b^2\left(\sqrt{-b^2}\,B-Ab\right)\right)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{-b^2}}}\right)}{\sqrt{-b^2}\sqrt{a-\sqrt{-b^2}}} + \frac{3\left(-\left(a^2\left(Ab+\sqrt{-\ldots}\right.\right.\right.}{\ldots}}{3d\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*Cot[c + d*x])/(a + b*Cot[c + d*x])^(5/2),x]
```

```
[Out] -1/3*((3*(2*a*b*(A*Sqrt[-b^2] + b*B) + a^2*(A*b - Sqrt[-b^2]*B) + b^2*(-(A*
b) + Sqrt[-b^2]*B))*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - Sqrt[-b^2]]])
/(Sqrt[-b^2]*Sqrt[a - Sqrt[-b^2]]) + (3*(2*a*b*(A*Sqrt[-b^2] - b*B) - a^2*(
A*b + Sqrt[-b^2]*B) + b^2*(A*b + Sqrt[-b^2]*B))*ArcTanh[Sqrt[a + b*Cot[c +
d*x]]/Sqrt[a + Sqrt[-b^2]]])/(Sqrt[-b^2]*Sqrt[a + Sqrt[-b^2]]) + (2*(a^2 +
b^2)*(-(A*b) + a*B))/(a + b*Cot[c + d*x])^(3/2) + (6*(-2*a*A*b + a^2*B - b^
2*B))/Sqrt[a + b*Cot[c + d*x]])/((a^2 + b^2)^2*d)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\cot(dx+c)+A}{(b\cot(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate((B*cot(d*x + c) + A)/(b*cot(d*x + c) + a)^(5/2), x)
```

maple [B] time = 0.44, size = 12836, normalized size = 69.38

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{B\cot(dx+c)+A}{(b\cot(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((B*cot(d*x + c) + A)/(b*cot(d*x + c) + a)^(5/2), x)
```

mupad [B] time = 17.93, size = 9453, normalized size = 51.10

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((A + B*cot(c + d*x))/(a + b*cot(c + d*x))^(5/2),x)
```

```
[Out] (log((((a + b*cot(c + d*x))^(1/2)*(320*A^2*a^4*b^14*d^3 - 16*A^2*b^18*d^3 +
 1024*A^2*a^6*b^12*d^3 + 1440*A^2*a^8*b^10*d^3 + 1024*A^2*a^10*b^8*d^3 + 32
0*A^2*a^12*b^6*d^3 - 16*A^2*a^16*b^2*d^3) + ((((320*A^4*a^2*b^8*d^4 - 16*A^
4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*
d^4)^(1/2) - 4*A^2*a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 20*A^2*a*b^4*d^2)/(a^10*d
^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2
*d^4))^(1/2)*(896*A*a^6*b^15*d^4 - ((((320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^
4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2
) - 4*A^2*a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 20*A^2*a*b^4*d^2)/(a^10*d^4 + b^10
*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1
/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5
*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 +
13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*
d^5 + 64*a^21*b^2*d^5))/4 - 160*A*a^2*b^19*d^4 - 128*A*a^4*b^17*d^4 - 32*A*
b^21*d^4 + 3136*A*a^8*b^13*d^4 + 4928*A*a^10*b^11*d^4 + 4480*A*a^12*b^9*d^4
 + 2432*A*a^14*b^7*d^4 + 736*A*a^16*b^5*d^4 + 96*A*a^18*b^3*d^4))/4)*(((320
*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^
4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) - 4*A^2*a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 2
0*A^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10
*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 - 96*A^3*a^3*b^13*d^2 - 240*A^3*a^5
*b^11*d^2 - 320*A^3*a^7*b^9*d^2 - 240*A^3*a^9*b^7*d^2 - 96*A^3*a^11*b^5*d^2
 - 16*A^3*a^13*b^3*d^2 - 16*A^3*a*b^15*d^2)*(((320*A^4*a^2*b^8*d^4 - 16*A^4
*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d
^4)^(1/2) - 4*A^2*a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 20*A^2*a*b^4*d^2)/(a^10*d^
4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*
d^4))^(1/2))/4 + (log((((a + b*cot(c + d*x))^(1/2)*(320*A^2*a^4*b^14*d^3 -
16*A^2*b^18*d^3 + 1024*A^2*a^6*b^12*d^3 + 1440*A^2*a^8*b^10*d^3 + 1024*A^2*
a^10*b^8*d^3 + 320*A^2*a^12*b^6*d^3 - 16*A^2*a^16*b^2*d^3) + ((-((320*A^4*a
^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4
- 400*A^4*a^8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 40*A^2*a^3*b^2*d^2 + 20*A^2*
a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b
^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(896*A*a^6*b^15*d^4 - ((-((320*A^4*a^2*b^8*d
^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^
4*a^8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 40*A^2*a^3*b^2*d^2 + 20*A^2*a*b^4*d^
2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 +
 5*a^8*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*
b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 161
28*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*
d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5))/4 - 160*A*a^2*b^19*d^4 - 128*A*a
^4*b^17*d^4 - 32*A*b^21*d^4 + 3136*A*a^8*b^13*d^4 + 4928*A*a^10*b^11*d^4 +
4480*A*a^12*b^9*d^4 + 2432*A*a^14*b^7*d^4 + 736*A*a^16*b^5*d^4 + 96*A*a^18*
b^3*d^4))/4)*(-((320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d
^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 40
```

```
*A^2*a^3*b^2*d^2 + 20*A^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 +
 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 - 96*A^3*a^3*b^
13*d^2 - 240*A^3*a^5*b^11*d^2 - 320*A^3*a^7*b^9*d^2 - 240*A^3*a^9*b^7*d^2 -
 96*A^3*a^11*b^5*d^2 - 16*A^3*a^13*b^3*d^2 - 16*A^3*a*b^15*d^2)*(-((320*A^4
*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^
4 - 400*A^4*a^8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 40*A^2*a^3*b^2*d^2 + 20*A^
2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6
*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 - log(- ((a + b*cot(c + d*x))^(1/2)*(32
0*A^2*a^4*b^14*d^3 - 16*A^2*b^18*d^3 + 1024*A^2*a^6*b^12*d^3 + 1440*A^2*a^8
*b^10*d^3 + 1024*A^2*a^10*b^8*d^3 + 320*A^2*a^12*b^6*d^3 - 16*A^2*a^16*b^2*
d^3) - (((320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 16
00*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) - 4*A^2*a^5*d^2 + 40*A^2*a^
3*b^2*d^2 - 20*A^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 +
 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*((((320*A^4*a^2
*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 -
400*A^4*a^8*b^2*d^4)^(1/2) - 4*A^2*a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 20*A^2*a*
b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 16
0*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^2
2*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^
9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5
+ 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5) - 32*A*b^21*d^4 -
 160*A*a^2*b^19*d^4 - 128*A*a^4*b^17*d^4 + 896*A*a^6*b^15*d^4 + 3136*A*a^8*
b^13*d^4 + 4928*A*a^10*b^11*d^4 + 4480*A*a^12*b^9*d^4 + 2432*A*a^14*b^7*d^4
 + 736*A*a^16*b^5*d^4 + 96*A*a^18*b^3*d^4))*(((320*A^4*a^2*b^8*d^4 - 16*A^4
*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d
^4)^(1/2) - 4*A^2*a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 20*A^2*a*b^4*d^2)/(16*a^10
*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 8
0*a^8*b^2*d^4))^(1/2) - 96*A^3*a^3*b^13*d^2 - 240*A^3*a^5*b^11*d^2 - 320*A^
3*a^7*b^9*d^2 - 240*A^3*a^9*b^7*d^2 - 96*A^3*a^11*b^5*d^2 - 16*A^3*a^13*b^3
*d^2 - 16*A^3*a*b^15*d^2)*(((320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A
^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) - 4*A^2*
a^5*d^2 + 40*A^2*a^3*b^2*d^2 - 20*A^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4
 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1
/2) - log(- ((a + b*cot(c + d*x))^(1/2)*(320*A^2*a^4*b^14*d^3 - 16*A^2*b^18
*d^3 + 1024*A^2*a^6*b^12*d^3 + 1440*A^2*a^8*b^10*d^3 + 1024*A^2*a^10*b^8*d^
3 + 320*A^2*a^12*b^6*d^3 - 16*A^2*a^16*b^2*d^3) - (-((320*A^4*a^2*b^8*d^4 -
 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^
8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 40*A^2*a^3*b^2*d^2 + 20*A^2*a*b^4*d^2)/(
16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*
d^4 + 80*a^8*b^2*d^4))^(1/2)*((-((320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1
760*A^4*a^4*b^6*d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) + 4
*A^2*a^5*d^2 - 40*A^2*a^3*b^2*d^2 + 20*A^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^1
0*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4
))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 288
0*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d
```

```
^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19
*b^4*d^5 + 64*a^21*b^2*d^5) - 32*A*b^21*d^4 - 160*A*a^2*b^19*d^4 - 128*A*a^
4*b^17*d^4 + 896*A*a^6*b^15*d^4 + 3136*A*a^8*b^13*d^4 + 4928*A*a^10*b^11*d^
4 + 4480*A*a^12*b^9*d^4 + 2432*A*a^14*b^7*d^4 + 736*A*a^16*b^5*d^4 + 96*A*a
^18*b^3*d^4))*(-((320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*
d^4 + 1600*A^4*a^6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 4
0*A^2*a^3*b^2*d^2 + 20*A^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b
^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) - 96*A^
3*a^3*b^13*d^2 - 240*A^3*a^5*b^11*d^2 - 320*A^3*a^7*b^9*d^2 - 240*A^3*a^9*b
^7*d^2 - 96*A^3*a^11*b^5*d^2 - 16*A^3*a^13*b^3*d^2 - 16*A^3*a*b^15*d^2)*(-(
(320*A^4*a^2*b^8*d^4 - 16*A^4*b^10*d^4 - 1760*A^4*a^4*b^6*d^4 + 1600*A^4*a^
6*b^4*d^4 - 400*A^4*a^8*b^2*d^4)^(1/2) + 4*A^2*a^5*d^2 - 40*A^2*a^3*b^2*d^2
 + 20*A^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*
b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) + (log(40*B^3*a^8*b^8*d^
2 - 8*B^3*b^16*d^2 - 40*B^3*a^2*b^14*d^2 - 72*B^3*a^4*b^12*d^2 - 40*B^3*a^6
*b^10*d^2 - (((a + b*cot(c + d*x))^(1/2)*(320*B^2*a^4*b^14*d^3 - 16*B^2*b^1
8*d^3 + 1024*B^2*a^6*b^12*d^3 + 1440*B^2*a^8*b^10*d^3 + 1024*B^2*a^10*b^8*d
^3 + 320*B^2*a^12*b^6*d^3 - 16*B^2*a^16*b^2*d^3) - ((((320*B^4*a^2*b^8*d^4
- 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a
^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*B^2*a*b^4*d^2)/
(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*
a^8*b^2*d^4))^(1/2)*(96*B*a*b^20*d^4 - ((a + b*cot(c + d*x))^(1/2)*(((320*B
^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*
d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*
B^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a
^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880
*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^
5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*
b^4*d^5 + 64*a^21*b^2*d^5))/4 + 736*B*a^3*b^18*d^4 + 2432*B*a^5*b^16*d^4 +
4480*B*a^7*b^14*d^4 + 4928*B*a^9*b^12*d^4 + 3136*B*a^11*b^10*d^4 + 896*B*a^
13*b^8*d^4 - 128*B*a^15*b^6*d^4 - 160*B*a^17*b^4*d^4 - 32*B*a^19*b^2*d^4))/
4)*(((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B
^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^
2*d^2 + 20*B^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6
*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 + 72*B^3*a^10*b^6*d^2 + 40
*B^3*a^12*b^4*d^2 + 8*B^3*a^14*b^2*d^2)*(((320*B^4*a^2*b^8*d^4 - 16*B^4*b^1
0*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^
(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*B^2*a*b^4*d^2)/(a^10*d^4 +
b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4)
)^(1/2))/4 + (log(40*B^3*a^8*b^8*d^2 - 8*B^3*b^16*d^2 - 40*B^3*a^2*b^14*d^2
 - 72*B^3*a^4*b^12*d^2 - 40*B^3*a^6*b^10*d^2 - (((a + b*cot(c + d*x))^(1/2)
*(320*B^2*a^4*b^14*d^3 - 16*B^2*b^18*d^3 + 1024*B^2*a^6*b^12*d^3 + 1440*B^2
*a^8*b^10*d^3 + 1024*B^2*a^10*b^8*d^3 + 320*B^2*a^12*b^6*d^3 - 16*B^2*a^16*
b^2*d^3) - ((-((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^
4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*
```

B^2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(96*B*a*b^20*d^4 - ((a + b*cot(c + d*x))^(1/2)*(-((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5))/4 + 736*B*a^3*b^18*d^4 + 2432*B*a^5*b^16*d^4 + 4480*B*a^7*b^14*d^4 + 4928*B*a^9*b^12*d^4 + 3136*B*a^11*b^10*d^4 + 896*B*a^13*b^8*d^4 - 128*B*a^15*b^6*d^4 - 160*B*a^17*b^4*d^4 - 32*B*a^19*b^2*d^4))/4)*(-((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 + 72*B^3*a^10*b^6*d^2 + 40*B^3*a^12*b^4*d^2 + 8*B^3*a^14*b^2*d^2)*(-((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 - log(((a + b*cot(c + d*x))^(1/2)*(320*B^2*a^4*b^14*d^3 - 16*B^2*b^18*d^3 + 1024*B^2*a^6*b^12*d^3 + 1440*B^2*a^8*b^10*d^3 + 1024*B^2*a^10*b^8*d^3 + 320*B^2*a^12*b^6*d^3 - 16*B^2*a^16*b^2*d^3) + (((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*B^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*((a + b*cot(c + d*x))^(1/2)*(((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*B^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5) + 96*B*a*b^20*d^4 + 736*B*a^3*b^18*d^4 + 2432*B*a^5*b^16*d^4 + 4480*B*a^7*b^14*d^4 + 4928*B*a^9*b^12*d^4 + 3136*B*a^11*b^10*d^4 + 896*B*a^13*b^8*d^4 - 128*B*a^15*b^6*d^4 - 160*B*a^17*b^4*d^4 - 32*B*a^19*b^2*d^4))*(((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*B^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) - 8*B^3*b^16*d^2 - 40*B^3*a^2*b^14*d^2 - 72*B^3*a^4*b^12*d^2 - 40*B^3*a^6*b^10*d^2 + 40*B^3*a^8*b^8*d^2 + 72*B^3*a^10*b^6*d^2 + 40*B^3*a^12*b^4*d^2 + 8*B^3*a^14*b^2*d^2)*(((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) + 4*B^2*a^5*d^2 - 40*B^2*a^3*b^2*d^2 + 20*B^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6

```
*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) - log(((a + b*cot(c + d*x))^(1/2)*(320*B^
2*a^4*b^14*d^3 - 16*B^2*b^18*d^3 + 1024*B^2*a^6*b^12*d^3 + 1440*B^2*a^8*b^1
0*d^3 + 1024*B^2*a^10*b^8*d^3 + 320*B^2*a^12*b^6*d^3 - 16*B^2*a^16*b^2*d^3)
 + (-((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*
B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^2*a^3*b
^2*d^2 - 20*B^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 16
0*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*((a + b*cot(c + d*
x))^(1/2)*(-((320*B^4*a^2*b^8*d^4 - 16*B^4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4
+ 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^
2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d
^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(64*a*b^22*
d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*
b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 +
2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5) + 96*B*a*b^20*d^4 +
 736*B*a^3*b^18*d^4 + 2432*B*a^5*b^16*d^4 + 4480*B*a^7*b^14*d^4 + 4928*B*a^
9*b^12*d^4 + 3136*B*a^11*b^10*d^4 + 896*B*a^13*b^8*d^4 - 128*B*a^15*b^6*d^4
 - 160*B*a^17*b^4*d^4 - 32*B*a^19*b^2*d^4))*(-((320*B^4*a^2*b^8*d^4 - 16*B^
4*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*
d^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(16*a^1
0*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 +
80*a^8*b^2*d^4))^(1/2) - 8*B^3*b^16*d^2 - 40*B^3*a^2*b^14*d^2 - 72*B^3*a^4*
b^12*d^2 - 40*B^3*a^6*b^10*d^2 + 40*B^3*a^8*b^8*d^2 + 72*B^3*a^10*b^6*d^2 +
 40*B^3*a^12*b^4*d^2 + 8*B^3*a^14*b^2*d^2)*(-((320*B^4*a^2*b^8*d^4 - 16*B^4
*b^10*d^4 - 1760*B^4*a^4*b^6*d^4 + 1600*B^4*a^6*b^4*d^4 - 400*B^4*a^8*b^2*d
^4)^(1/2) - 4*B^2*a^5*d^2 + 40*B^2*a^3*b^2*d^2 - 20*B^2*a*b^4*d^2)/(16*a^10
*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 8
0*a^8*b^2*d^4))^(1/2) - ((2*B*a)/(3*(a^2 + b^2)) + (2*B*(a^2 - b^2)*(a + b*
cot(c + d*x)))/(a^2 + b^2)^2)/(d*(a + b*cot(c + d*x))^(3/2)) + ((2*A*b)/(3*
(a^2 + b^2)) + (4*A*a*b*(a + b*cot(c + d*x)))/(a^2 + b^2)^2)/(d*(a + b*cot(
c + d*x))^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{A + B\cot(c + dx)}{(a + b\cot(c + dx))^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((A+B*cot(d*x+c))/(a+b*cot(d*x+c))**(5/2),x)
```

```
[Out] Integral((A + B*cot(c + d*x))/(a + b*cot(c + d*x))**(5/2), x)
```

3.104 $\int \frac{-a+b\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx$

Optimal. Leaf size=102

$$\frac{(b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}-\frac{(-b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}$$

```
[Out] -(I*a-b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/d/(a-I*b)^(1/2)+(I*a
+b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/d/(a+I*b)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {3539, 3537, 63, 208}

$$\frac{(b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d\sqrt{a+ib}}-\frac{(-b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d\sqrt{a-ib}}$$

Antiderivative was successfully verified.

```
[In] Int[(-a + b*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] -(((I*a - b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/(Sqrt[a - I*b
]*d)) + ((I*a + b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/(Sqrt[a
 + I*b]*d)
```

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]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
```

```
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{-a+b\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx &= \frac{1}{2}(-a-ib)\int \frac{1+i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx+\frac{1}{2}(-a+ib)\int \frac{1-i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx \\
&= \frac{(ia-b)\,\mathrm{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a-ibx}}\,dx,x,i\cot(c+dx)\right)}{2d}-\frac{(ia+b)\,\mathrm{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a+ibx}}\,dx\right.}{2d} \\
&= -\frac{(a-ib)\,\mathrm{Subst}\left(\int \frac{1}{-1+\frac{ia}{b}-\frac{ix^2}{b}}\,dx,x,\sqrt{a+b\cot(c+dx)}\right)}{bd}-\frac{(a+ib)\,\mathrm{Subst}\left(\int \frac{1}{-1-\frac{ia}{b}+\frac{ix^2}{b}}\right.}{bd} \\
&= -\frac{(ia-b)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{\sqrt{a-ib}\,d}+\frac{(ia+b)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{\sqrt{a+ib}\,d}
\end{aligned}$$

Mathematica [A] time = 0.33, size = 146, normalized size = 1.43

$$\frac{b\left(\left(a+\sqrt{-b^2}\right)^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-\sqrt{-b^2}}}\right)-\left(a-\sqrt{-b^2}\right)^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+\sqrt{-b^2}}}\right)\right)}{\sqrt{-b^2}\,d\sqrt{a-\sqrt{-b^2}}\,\sqrt{a+\sqrt{-b^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-a + b*Cot[c + d*x])/Sqrt[a + b*Cot[c + d*x]],x]
```

```
[Out] (b*((a + Sqrt[-b^2])^(3/2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - Sqrt[-
b^2]]] - (a - Sqrt[-b^2])^(3/2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + S
qrt[-b^2]]]))/(Sqrt[-b^2]*Sqrt[a - Sqrt[-b^2]]*Sqrt[a + Sqrt[-b^2]]*d)
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)-a}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) - a)/sqrt(b*cot(d*x + c) + a), x)
```

maple [B] time = 0.54, size = 1905, normalized size = 18.68

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x)
```

```
[Out] 1/4/d/b/(a^2+b^2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/
2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3+1/4/d*b/(a
^2+b^2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-1/4/d/b/(a^2+b^2)^(3/2
)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a
^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4+1/4/d*b^3/(a^2+b^2)^(3/2)*
ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2
+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-1/d/b/(a^2+b^2)^(1/2)/(2*(a^2+b^
2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a
)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3-1/d*b/(a^2+b^2)^(1/2)/(2*(a^2+b
^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*
a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a-1/d*b/(a^2+b^2)/(2*(a^2+b^2)^(1/
2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2
))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2+1/d/b/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1
/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/
2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^5-1/d*b^3/(a^2+b^2)/(2*(a^2+b^2)^(1/2)
-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))
/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))+3/d*b^3/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-
2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/
(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a+4/d*b/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2
*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(
2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3-1/4/d/b/(a^2+b^2)*ln((a+b*cot(d*x+c))^(1/
```

```
2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^
2)^(1/2)+2*a)^(1/2)*a^3-1/4/d*b/(a^2+b^2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2
+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2
*a)^(1/2)*a+1/4/d/b/(a^2+b^2)^(3/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^
(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)*a^4-1/4/d*b^3/(a^2+b^2)^(3/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1
/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2
)+1/d/b/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^
(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a
^3+1/d*b/(a^2+b^2)^(1/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)
^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*
a+1/d*b/(a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+
2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2-1/d
/b/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)
+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^5+1/
d*b^3/(a^2+b^2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*
a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-3/d*b^3/(
a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a
)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a-4/d*b/(a
^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)
^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)-a}{\sqrt{b\cot(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cot(d*x + c) - a)/sqrt(b*cot(d*x + c) + a), x)
```

mupad [B] time = 2.20, size = 2731, normalized size = 26.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a - b*cot(c + d*x))/(a + b*cot(c + d*x))^(1/2),x)
```

```
[Out] 2*atanh((32*a^4*b^2*d^2*(- (-16*a^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4))
 - (a^3*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((1
6*a^4*b^5*d^5)/(a^2*d^4 + b^2*d^4) + (16*a^6*b^3*d^5)/(a^2*d^4 + b^2*d^4) +
 (4*a^3*b^3*d^4*(-16*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (4*a*b^5*d^4
*(-16*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) - (32*a^2*b^2*(- (-16*a^4*b^
```

```
2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (a^3*d^2)/(4*(a^2*d^4 + b^2*d^4)))^
(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*a^4*b^3*d^3)/(a^2*d^4 + b^2*d^4) + (
4*a*b^3*d^2*(-16*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) + (8*a*b^2*(- (-1
6*a^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (a^3*d^2)/(4*(a^2*d^4 + b^2
*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(-16*a^4*b^2*d^4)^(1/2))/((16*a^4*
b^5*d^5)/(a^2*d^4 + b^2*d^4) + (16*a^6*b^3*d^5)/(a^2*d^4 + b^2*d^4) + (4*a^
3*b^3*d^4*(-16*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (4*a*b^5*d^4*(-16*
a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)))*(- (-16*a^4*b^2*d^4)^(1/2)/(16*(a
^2*d^4 + b^2*d^4)) - (a^3*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2) - 2*atanh((32
*a^2*b^2*((-16*a^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (a^3*d^2)/(4*(
a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*a^4*b^3*d^3)/(a
^2*d^4 + b^2*d^4) - (4*a*b^3*d^2*(-16*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^
5)) - (32*a^4*b^2*d^2*((-16*a^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) - (
a^3*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*a^
4*b^5*d^5)/(a^2*d^4 + b^2*d^4) + (16*a^6*b^3*d^5)/(a^2*d^4 + b^2*d^4) - (4*
a^3*b^3*d^4*(-16*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) - (4*a*b^5*d^4*(-1
6*a^4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) + (8*a*b^2*((-16*a^4*b^2*d^4)^(1
/2)/(16*(a^2*d^4 + b^2*d^4)) - (a^3*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)*(a
+ b*cot(c + d*x))^(1/2)*(-16*a^4*b^2*d^4)^(1/2))/((16*a^4*b^5*d^5)/(a^2*d^4
 + b^2*d^4) + (16*a^6*b^3*d^5)/(a^2*d^4 + b^2*d^4) - (4*a^3*b^3*d^4*(-16*a^
4*b^2*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) - (4*a*b^5*d^4*(-16*a^4*b^2*d^4)^(1/2
))/(a^2*d^5 + b^2*d^5)))*((-16*a^4*b^2*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4))
- (a^3*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2) + 2*atanh((32*b^4*((a*b^2*d^2)/(
4*(a^2*d^4 + b^2*d^4)) - (-16*b^6*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)))^(1/2
)*(a + b*cot(c + d*x))^(1/2))/((16*b^5)/d - (16*a^2*b^5*d^3)/(a^2*d^4 + b^2
*d^4) + (4*a*b^3*d^2*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) + (8*a*b^2*(
(a*b^2*d^2)/(4*(a^2*d^4 + b^2*d^4)) - (-16*b^6*d^4)^(1/2)/(16*(a^2*d^4 + b^
2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(-16*b^6*d^4)^(1/2))/(16*b^7*d +
16*a^2*b^5*d - (16*a^2*b^7*d^5)/(a^2*d^4 + b^2*d^4) - (16*a^4*b^5*d^5)/(a^2
*d^4 + b^2*d^4) + (4*a*b^5*d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (
4*a^3*b^3*d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) - (32*a^2*b^4*d^2*(
(a*b^2*d^2)/(4*(a^2*d^4 + b^2*d^4)) - (-16*b^6*d^4)^(1/2)/(16*(a^2*d^4 + b^
2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/(16*b^7*d + 16*a^2*b^5*d - (16*a
^2*b^7*d^5)/(a^2*d^4 + b^2*d^4) - (16*a^4*b^5*d^5)/(a^2*d^4 + b^2*d^4) + (4
*a*b^5*d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (4*a^3*b^3*d^4*(-16*b
^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)))*((a*b^2*d^2)/(4*(a^2*d^4 + b^2*d^4)) -
 (-16*b^6*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)))^(1/2) + 2*atanh((8*a*b^2*((-
16*b^6*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) + (a*b^2*d^2)/(4*(a^2*d^4 + b^2*
d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(-16*b^6*d^4)^(1/2))/((16*a^2*b^7*d
^5)/(a^2*d^4 + b^2*d^4) - 16*a^2*b^5*d - 16*b^7*d + (16*a^4*b^5*d^5)/(a^2*d
^4 + b^2*d^4) + (4*a*b^5*d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (4*
a^3*b^3*d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) - (32*b^4*((-16*b^6*d
^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) + (a*b^2*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(
1/2)*(a + b*cot(c + d*x))^(1/2))/((16*a^2*b^5*d^3)/(a^2*d^4 + b^2*d^4) - (1
6*b^5)/d + (4*a*b^3*d^2*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)) + (32*a^2
```

```
*b^4*d^2*((-16*b^6*d^4)^(1/2)/(16*(a^2*d^4 + b^2*d^4)) + (a*b^2*d^2)/(4*(a^
2*d^4 + b^2*d^4)))^(1/2)*(a + b*cot(c + d*x))^(1/2))/((16*a^2*b^7*d^5)/(a^2
*d^4 + b^2*d^4) - 16*a^2*b^5*d - 16*b^7*d + (16*a^4*b^5*d^5)/(a^2*d^4 + b^2
*d^4) + (4*a*b^5*d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5) + (4*a^3*b^3*
d^4*(-16*b^6*d^4)^(1/2))/(a^2*d^5 + b^2*d^5)))*((-16*b^6*d^4)^(1/2)/(16*(a^
2*d^4 + b^2*d^4)) + (a*b^2*d^2)/(4*(a^2*d^4 + b^2*d^4)))^(1/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a}{\sqrt{a+b\cot(c+dx)}}\,dx-\int \left(-\frac{b\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))**(1/2),x)
```

```
[Out] -Integral(a/sqrt(a + b*cot(c + d*x)), x) - Integral(-b*cot(c + d*x)/sqrt(a
+ b*cot(c + d*x)), x)
```

3.105 $\int \frac{-a+b\cot(c+dx)}{(a+b\cot(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=132

$$-\frac{4ab}{d\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}-\frac{(-b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{3/2}}+\frac{(b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d(a+ib)^{3/2}}$$

```
[Out] -(I*a-b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/(a-I*b)^(3/2)/d+(I*a
+b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/(a+I*b)^(3/2)/d-4*a*b/(a^
2+b^2)/d/(a+b*cot(d*x+c))^(1/2)
```

Rubi [A] time = 0.25, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {3529, 3539, 3537, 63, 208}

$$-\frac{4ab}{d\left(a^2+b^2\right)\sqrt{a+b\cot(c+dx)}}-\frac{(-b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{3/2}}+\frac{(b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{d(a+ib)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(-a + b*Cot[c + d*x])/(a + b*Cot[c + d*x])^(3/2),x]
```

```
[Out] -(((I*a - b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/((a - I*b)^(3
/2)*d)) + ((I*a + b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/((a +
 I*b)^(3/2)*d) - (4*a*b)/((a^2 + b^2)*d*Sqrt[a + b*Cot[c + d*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 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 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
```

```
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{-a+b\cot(c+dx)}{(a+b\cot(c+dx))^{3/2}}\,dx &= -\frac{4ab}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}}+\frac{\int \frac{-a^2+b^2+2ab\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx}{a^2+b^2}\\
&= -\frac{4ab}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}}-\frac{(a-ib)\int \frac{1-i\cot(c+dx)}{\sqrt{a+b\cot(c+dx)}}\,dx}{2(a+ib)}-\frac{(a+ib)\int \frac{1+i\cot(c+}{\sqrt{a+b\cot(c}}}{2(a-ib)}\\
&= -\frac{4ab}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}}-\frac{(a+ib)\,\mathrm{Subst}\left(\int \frac{1}{(-1+x)\sqrt{a-ibx}}\,dx,x,i\cot(c+dx)\right)}{2(ia+b)d}\\
&= -\frac{4ab}{\left(a^2+b^2\right)d\sqrt{a+b\cot(c+dx)}}-\frac{(a-ib)\,\mathrm{Subst}\left(\int \frac{1}{-1+\frac{ia}{b}-\frac{ix^2}{b}}\,dx,x,\sqrt{a+b\cot(c+}\right.}{(a+ib)bd}\\
&= -\frac{(ia-b)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{(a-ib)^{3/2}d}+\frac{(ia+b)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{(a+ib)^{3/2}d}-\frac{4}{\left(a^2+b^2\right)d\sqrt{a}}
\end{aligned}$$

Mathematica [A] time = 1.47, size = 216, normalized size = 1.64

$$\frac{\sin(c+dx)(a-b\cot(c+dx))\left(\sqrt{a-ib}\left(i(a-ib)^2\sqrt{a+b\cot(c+dx)}\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)-4ab\sqrt{a+ib}\right)-i(\cdots}{d(a-ib)^{3/2}(a+ib)^{3/2}\sqrt{a+b\cot(c+dx)}\,(a\sin(c+dx)-b\cos(c+\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-a + b*Cot[c + d*x])/(a + b*Cot[c + d*x])^(3/2),x]
```

```
[Out] ((a - b*Cot[c + d*x])*((-I)*(a + I*b)^(5/2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]
]/Sqrt[a - I*b]]*Sqrt[a + b*Cot[c + d*x]] + Sqrt[a - I*b]*(-4*a*Sqrt[a + I*
b]*b + I*(a - I*b)^2*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]]*Sqrt[a
 + b*Cot[c + d*x]]))*Sin[c + d*x])/((a - I*b)^(3/2)*(a + I*b)^(3/2)*d*Sqrt[
a + b*Cot[c + d*x]]*(-(b*Cos[c + d*x]) + a*Sin[c + d*x]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)-a}{(b\cot(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) - a)/(b*cot(d*x + c) + a)^(3/2), x)
```

maple [B] time = 0.56, size = 2291, normalized size = 17.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x)
```

```
[Out] -1/d/b/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(
1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^
```

6+1/4/d/b/(a^2+b^2)^(5/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)
^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^5-4/
d*b/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2
)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4+1
/d*b^3/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x
+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^
2+1/d*b^3/(a^2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(
d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))
+1/4/d*b^3/(a^2+b^2)^2*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-1/d/b/(a^
2+b^2)^(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)
+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4-1/4/d/b/
(a^2+b^2)^2*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d
x+c)-a-(a^2+b^2)^(1/2))(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4+2/d*b^5/(a^2+b^2
)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)
-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-2/d*b^5/(a^2+b^2)
^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a
^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-1/d*b^3/(a^2+b^2)^
(3/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2
*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))-1/4/d*b^3/(a^2+b^2)
^2*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(
a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-1/2/d*b/(a^2+b^2)^(5/2)*ln((a
+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)
^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3+1/4/d/b/(a^2+b^2)^2*ln(b*cot(d*x+
c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*
(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4-3/4/d*b^3/(a^2+b^2)^(5/2)*ln((a+b*cot(d*x
+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2
*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-1/d*b^3/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1/2)-2*
a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2
*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2+3/4/d*b^3/(a^2+b^2)^(5/2)*ln(b*cot(d*x+c)+
a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*
(a^2+b^2)^(1/2)+2*a)^(1/2)*a-2/d*b^3/(a^2+b^2)^2/(2*(a^2+b^2)^(1/2)-2*a)^(1
/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2
+b^2)^(1/2)-2*a)^(1/2))*a+1/d/b/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/
2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+
b^2)^(1/2)-2*a)^(1/2))*a^6-4*a*b/(a^2+b^2)/d/(a+b*cot(d*x+c))^(1/2)+2/d*b^3
/(a^2+b^2)^2/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^
(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a-1/4/d/b/(a
^2+b^2)^(5/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2
a)^(1/2)+(a^2+b^2)^(1/2))(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^5+4/d*b/(a^2+b^2
)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(
a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4+1/2/d*b/(a^2+
b^2)^(5/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)
^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3-2/d*b/(a^2+b^2)^2
/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2

```
)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3+1/d/b/(a^2+b^2)^(3/2
)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+
b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4+2/d*b/(a^2+b^2)^2/(
2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*c
ot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)-a}{(b\cot(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cot(d*x + c) - a)/(b*cot(d*x + c) + a)^(3/2), x)
```

mupad [B] time = 5.96, size = 5475, normalized size = 41.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a - b*cot(c + d*x))/(a + b*cot(c + d*x))^(3/2),x)
```

```
[Out] log(8*a*b^11*d^2 - (((((24*a*b^4*d^2 - 8*a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4
 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - 12*a*b^4*d^2 + 4*
a^3*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2
)*(64*a^6*b^7*d^4 - 96*a^2*b^11*d^4 - 64*a^4*b^9*d^4 - 32*b^13*d^4 + 96*a^8
*b^5*d^4 + 32*a^10*b^3*d^4 + (a + b*cot(c + d*x))^(1/2)*((((24*a*b^4*d^2 -
8*a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4
*b^2*d^4))^(1/2) - 12*a*b^4*d^2 + 4*a^3*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3
*a^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 6
40*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5)) + (a
 + b*cot(c + d*x))^(1/2)*(16*b^12*d^3 + 32*a^2*b^10*d^3 - 32*a^6*b^6*d^3 -
16*a^8*b^4*d^3))*((((24*a*b^4*d^2 - 8*a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4 +
16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - 12*a*b^4*d^2 + 4*a^3
*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2) +
 24*a^3*b^9*d^2 + 24*a^5*b^7*d^2 + 8*a^7*b^5*d^2)*((((24*a*b^4*d^2 - 8*a^3*
b^2*d^2)^2/4 - b^4*(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d
^4))^(1/2) - 12*a*b^4*d^2 + 4*a^3*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*a^2*b
^4*d^4 + 3*a^4*b^2*d^4)))^(1/2) + log(8*a*b^11*d^2 - ((-(((24*a*b^4*d^2 - 8
*a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*
b^2*d^4))^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*
a^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2)*(64*a^6*b^7*d^4 - 96*a^2*b^11*d^4 - 64
*a^4*b^9*d^4 - 32*b^13*d^4 + 96*a^8*b^5*d^4 + 32*a^10*b^3*d^4 + (a + b*cot(
```

```
c + d*x))^(1/2)*(-(((24*a*b^4*d^2 - 8*a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4 +
16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) + 12*a*b^4*d^2 - 4*a^3
*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2)*(
64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*
a^9*b^4*d^5 + 64*a^11*b^2*d^5)) + (a + b*cot(c + d*x))^(1/2)*(16*b^12*d^3 +
 32*a^2*b^10*d^3 - 32*a^6*b^6*d^3 - 16*a^8*b^4*d^3))*(-(((24*a*b^4*d^2 - 8*
a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b
^2*d^4))^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^2*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*a
^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2) + 24*a^3*b^9*d^2 + 24*a^5*b^7*d^2 + 8*a
^7*b^5*d^2)*(-(((24*a*b^4*d^2 - 8*a^3*b^2*d^2)^2/4 - b^4*(16*a^6*d^4 + 16*b
^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^2
*d^2)/(16*(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4)))^(1/2) + (lo
g((((a + b*cot(c + d*x))^(1/2)*(16*a^2*b^10*d^3 + 32*a^4*b^8*d^3 - 32*a^8*b
^4*d^3 - 16*a^10*b^2*d^3) - ((((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b
^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*
d^4 + 3*a^4*b^2*d^4))^(1/2)*(((((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*
b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4
*d^4 + 3*a^4*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 32
0*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a
^11*b^2*d^5))/4 + 64*a^2*b^11*d^4 + 256*a^4*b^9*d^4 + 384*a^6*b^7*d^4 + 256
*a^8*b^5*d^4 + 64*a^10*b^3*d^4))/4)*(((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 14
4*a^8*b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a
^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))/4 + 8*a^3*b^9*d^2 + 24*a^5*b^7*d^2 + 24
*a^7*b^5*d^2 + 8*a^9*b^3*d^2)*(((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*
b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4
*d^4 + 3*a^4*b^2*d^4))^(1/2))/4 + (log((((a + b*cot(c + d*x))^(1/2)*(16*a^2
*b^10*d^3 + 32*a^4*b^8*d^3 - 32*a^8*b^4*d^3 - 16*a^10*b^2*d^3) - ((-((96*a^
6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) + 4*a^5*d^2 - 12*a^3*b^
2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(((-((96*
a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) + 4*a^5*d^2 - 12*a^3*
b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2)*(a + b*
cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 6
40*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5))/4 + 64*a^2*b^11*d^4 +
256*a^4*b^9*d^4 + 384*a^6*b^7*d^4 + 256*a^8*b^5*d^4 + 64*a^10*b^3*d^4))/4)*
(-((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) + 4*a^5*d^2 -
12*a^3*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))
/4 + 8*a^3*b^9*d^2 + 24*a^5*b^7*d^2 + 24*a^7*b^5*d^2 + 8*a^9*b^3*d^2)*(-((9
6*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) + 4*a^5*d^2 - 12*a^
3*b^2*d^2)/(a^6*d^4 + b^6*d^4 + 3*a^2*b^4*d^4 + 3*a^4*b^2*d^4))^(1/2))/4 -
log(8*a^3*b^9*d^2 - ((a + b*cot(c + d*x))^(1/2)*(16*a^2*b^10*d^3 + 32*a^4*b
^8*d^3 - 32*a^8*b^4*d^3 - 16*a^10*b^2*d^3) + (((96*a^6*b^4*d^4 - 16*a^4*b^6
*d^4 - 144*a^8*b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)/(16*a^6*d^4 + 1
6*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(64*a^2*b^11*d^4 - (((9
6*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^
3*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/
```

```
2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b
^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5) + 256*a^4*b^9
*d^4 + 384*a^6*b^7*d^4 + 256*a^8*b^5*d^4 + 64*a^10*b^3*d^4))*(((96*a^6*b^4*
d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)
/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) + 24*a^
5*b^7*d^2 + 24*a^7*b^5*d^2 + 8*a^9*b^3*d^2)*(((96*a^6*b^4*d^4 - 16*a^4*b^6*
d^4 - 144*a^8*b^2*d^4)^(1/2) - 4*a^5*d^2 + 12*a^3*b^2*d^2)/(16*a^6*d^4 + 16
*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - log(8*a^3*b^9*d^2 - ((
a + b*cot(c + d*x))^(1/2)*(16*a^2*b^10*d^3 + 32*a^4*b^8*d^3 - 32*a^8*b^4*d^
3 - 16*a^10*b^2*d^3) + (-((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*d^
4)^(1/2) + 4*a^5*d^2 - 12*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^
4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(64*a^2*b^11*d^4 - (-((96*a^6*b^4*d^4 - 16*a
^4*b^6*d^4 - 144*a^8*b^2*d^4)^(1/2) + 4*a^5*d^2 - 12*a^3*b^2*d^2)/(16*a^6*d
^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(a + b*cot(c + d*
x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*d^5 + 640*a^7*b^6
*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5) + 256*a^4*b^9*d^4 + 384*a^6*b^7*d
^4 + 256*a^8*b^5*d^4 + 64*a^10*b^3*d^4))*(-((96*a^6*b^4*d^4 - 16*a^4*b^6*d^
4 - 144*a^8*b^2*d^4)^(1/2) + 4*a^5*d^2 - 12*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b
^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) + 24*a^5*b^7*d^2 + 24*a^7*
b^5*d^2 + 8*a^9*b^3*d^2)*(-((96*a^6*b^4*d^4 - 16*a^4*b^6*d^4 - 144*a^8*b^2*
d^4)^(1/2) + 4*a^5*d^2 - 12*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*
b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - log(((a + b*cot(c + d*x))^(1/2)*(16*b^12
*d^3 + 32*a^2*b^10*d^3 - 32*a^6*b^6*d^3 - 16*a^8*b^4*d^3) + (((96*a^2*b^8*d
^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) - 12*a*b^4*d^2 + 4*a^3*b^2*d^2)/(
16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(32*b^13*
d^4 + (((96*a^2*b^8*d^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) - 12*a*b^4*d
^2 + 4*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*
d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 +
640*a^5*b^8*d^5 + 640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5) + 96
*a^2*b^11*d^4 + 64*a^4*b^9*d^4 - 64*a^6*b^7*d^4 - 96*a^8*b^5*d^4 - 32*a^10*
b^3*d^4))*(((96*a^2*b^8*d^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) - 12*a*b
^4*d^2 + 4*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*
b^2*d^4))^(1/2) + 8*a*b^11*d^2 + 24*a^3*b^9*d^2 + 24*a^5*b^7*d^2 + 8*a^7*b^
5*d^2)*(((96*a^2*b^8*d^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) - 12*a*b^4*
d^2 + 4*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2
*d^4))^(1/2) - log(((a + b*cot(c + d*x))^(1/2)*(16*b^12*d^3 + 32*a^2*b^10*d
^3 - 32*a^6*b^6*d^3 - 16*a^8*b^4*d^3) + (-((96*a^2*b^8*d^4 - 16*b^10*d^4 -
144*a^4*b^6*d^4)^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^2*d^2)/(16*a^6*d^4 + 16*b^6
*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(32*b^13*d^4 + (-((96*a^2*b^
8*d^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^2*d^2
)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2)*(a + b
*cot(c + d*x))^(1/2)*(64*a*b^12*d^5 + 320*a^3*b^10*d^5 + 640*a^5*b^8*d^5 +
640*a^7*b^6*d^5 + 320*a^9*b^4*d^5 + 64*a^11*b^2*d^5) + 96*a^2*b^11*d^4 + 64
*a^4*b^9*d^4 - 64*a^6*b^7*d^4 - 96*a^8*b^5*d^4 - 32*a^10*b^3*d^4))*(-((96*a
^2*b^8*d^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^
```

```
2*d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) +
 8*a*b^11*d^2 + 24*a^3*b^9*d^2 + 24*a^5*b^7*d^2 + 8*a^7*b^5*d^2)*(-((96*a^2
*b^8*d^4 - 16*b^10*d^4 - 144*a^4*b^6*d^4)^(1/2) + 12*a*b^4*d^2 - 4*a^3*b^2*
d^2)/(16*a^6*d^4 + 16*b^6*d^4 + 48*a^2*b^4*d^4 + 48*a^4*b^2*d^4))^(1/2) - (
4*a*b)/(d*(a^2 + b^2)*(a + b*cot(c + d*x))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a}{a\sqrt{a+b\cot(c+dx)}+b\sqrt{a+b\cot(c+dx)}\cot(c+dx)}\,dx-\int\left(-\frac{b\cot(c+dx)}{a\sqrt{a+b\cot(c+dx)}+b\sqrt{a+b\cot(c+d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))**(3/2),x)
```

```
[Out] -Integral(a/(a*sqrt(a + b*cot(c + d*x)) + b*sqrt(a + b*cot(c + d*x))*cot(c
+ d*x)), x) - Integral(-b*cot(c + d*x)/(a*sqrt(a + b*cot(c + d*x)) + b*sqrt
(a + b*cot(c + d*x))*cot(c + d*x)), x)
```

3.106 $\int \frac{-a+b\cot(c+dx)}{(a+b\cot(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=174

$$-\frac{2b\left(3a^2-b^2\right)}{d\left(a^2+b^2\right)^2\sqrt{a+b\cot(c+dx)}}-\frac{4ab}{3d\left(a^2+b^2\right)(a+b\cot(c+dx))^{3/2}}-\frac{(-b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{5/2}}+\frac{(b+ia)}{}$$

```
[Out] -(I*a-b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a-I*b)^(1/2))/(a-I*b)^(5/2)/d+(I*a
+b)*arctanh((a+b*cot(d*x+c))^(1/2)/(a+I*b)^(1/2))/(a+I*b)^(5/2)/d-4/3*a*b/(
a^2+b^2)/d/(a+b*cot(d*x+c))^(3/2)-2*b*(3*a^2-b^2)/(a^2+b^2)^2/d/(a+b*cot(d*
x+c))^(1/2)
```

Rubi [A] time = 0.38, antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185, Rules used = {3529, 3539, 3537, 63, 208}

$$-\frac{2b\left(3a^2-b^2\right)}{d\left(a^2+b^2\right)^2\sqrt{a+b\cot(c+dx)}}-\frac{4ab}{3d\left(a^2+b^2\right)(a+b\cot(c+dx))^{3/2}}-\frac{(-b+ia)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{d(a-ib)^{5/2}}+\frac{(b+ia)}{}$$

Antiderivative was successfully verified.

```
[In] Int[(-a + b*Cot[c + d*x])/(a + b*Cot[c + d*x])^(5/2),x]
```

```
[Out] -(((I*a - b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a - I*b]])/((a - I*b)^(5
/2)*d)) + ((I*a + b)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqrt[a + I*b]])/((a +
 I*b)^(5/2)*d) - (4*a*b)/(3*(a^2 + b^2)*d*(a + b*Cot[c + d*x])^(3/2)) - (2*
b*(3*a^2 - b^2))/((a^2 + b^2)^2*d*Sqrt[a + b*Cot[c + d*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 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 3529

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Simp[((b*c - a*d)*(a + b*Tan[e + f*x])^(m + 1))
/(f*(m + 1)*(a^2 + b^2)), x] + Dist[1/(a^2 + b^2), Int[(a + b*Tan[e + f*x])
^(m + 1)*Simp[a*c + b*d - (b*c - a*d)*Tan[e + f*x], x], x], x] /; FreeQ[{a,
 b, c, d, e, f}, x] && NeQ[b*c - a*d, 0] && NeQ[a^2 + b^2, 0] && LtQ[m, -1]
```

Rule 3537

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)]), x_Symbol] :> Dist[(c*d)/f, Subst[Int[(a + (b*x)/d)^m/(d^2 + c
*x), x], x, d*Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b
*c - a*d, 0] && NeQ[a^2 + b^2, 0] && EqQ[c^2 + d^2, 0]
```

Rule 3539

```
Int[((a_.) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_.) + (d_.)*tan[(e_.) +
 (f_.)*(x_)]), x_Symbol] :> Dist[(c + I*d)/2, Int[(a + b*Tan[e + f*x])^m*(1
 - I*Tan[e + f*x]), x], x] + Dist[(c - I*d)/2, Int[(a + b*Tan[e + f*x])^m*(
1 + I*Tan[e + f*x]), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && NeQ[b*c -
 a*d, 0] && NeQ[a^2 + b^2, 0] && NeQ[c^2 + d^2, 0] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{-a+b\cot(c+dx)}{(a+b\cot(c+dx))^{5/2}}\,dx = -\frac{4ab}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} + \frac{\int \frac{-a^2+b^2+2ab\cot(c+dx)}{(a+b\cot(c+dx))^{3/2}}\,dx}{a^2+b^2}$$

$$= -\frac{4ab}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} + \frac{\int \frac{-a\left(a^2-3\right.}{}}{}$$

$$= -\frac{4ab}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} - \frac{(a-ib)\int}{2}$$

$$= -\frac{4ab}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} + \frac{(ia-b)\,\mathrm{S}}{}$$

$$= -\frac{4ab}{3\left(a^2+b^2\right)d(a+b\cot(c+dx))^{3/2}} - \frac{2b\left(3a^2-b^2\right)}{\left(a^2+b^2\right)^2 d\sqrt{a+b\cot(c+dx)}} + \frac{(a+ib)\,\mathrm{S}}{}$$

$$= -\frac{(ia-b)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a-ib}}\right)}{(a-ib)^{5/2}d} + \frac{(ia+b)\tanh^{-1}\left(\frac{\sqrt{a+b\cot(c+dx)}}{\sqrt{a+ib}}\right)}{(a+ib)^{5/2}d} - \frac{}{3\left(a^2+b^2\right)d}$$

Mathematica [A] time = 5.94, size = 232, normalized size = 1.33

$$\frac{\sin(c+dx)(b\cot(c+dx)-a)\left(-\frac{2b(a+b\cot(c+dx))\left(-11a^3+\left(3b^3-9a^2b\right)\cot(c+dx)+ab^2\right)}{\left(a^2+b^2\right)^2} + \frac{3i(a+b\cot(c+dx))^{5/2}\left((a+ib)^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+b\cot}}{\sqrt{a}}\right.\right.}{(a-ib)^{5/2}(}\right.}{3d(a+b\cot(c+dx))^{5/2}(a\sin(c+dx)-b\cos(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(-a + b*Cot[c + d*x])/(a + b*Cot[c + d*x])^(5/2),x]
```

```
[Out] ((-a + b*Cot[c + d*x])*(((3*I)*((a + I*b)^(7/2)*ArcTanh[Sqrt[a + b*Cot[c +
d*x]]/Sqrt[a - I*b]] - (a - I*b)^(7/2)*ArcTanh[Sqrt[a + b*Cot[c + d*x]]/Sqr
t[a + I*b]])*(a + b*Cot[c + d*x])^(5/2))/((a - I*b)^(5/2)*(a + I*b)^(5/2))
- (2*b*(a + b*Cot[c + d*x])*(-11*a^3 + a*b^2 + (-9*a^2*b + 3*b^3)*Cot[c + d
*x]))/(a^2 + b^2)^2)*Sin[c + d*x])/(3*d*(a + b*Cot[c + d*x])^(5/2)*(-(b*Cos
[c + d*x]) + a*Sin[c + d*x]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)-a}{(b\cot(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*cot(d*x + c) - a)/(b*cot(d*x + c) + a)^(5/2), x)
```

maple [B] time = 0.56, size = 3055, normalized size = 17.56

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x)
```

```
[Out] -1/2/d*b/(a^2+b^2)^3*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^
(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^3-2/d*b/(
a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a
)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3+5/4/d*
b/(a^2+b^2)^(7/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/
2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^4+3/d*b/(a^2
+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+
(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^5+2/d*b^3/(
a^2+b^2)^2/(a+b*cot(d*x+c))^(1/2)+1/d*b^5/(a^2+b^2)^3/(2*(a^2+b^2)^(1/2)-2*
a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2
*(a^2+b^2)^(1/2)-2*a)^(1/2))-6/d*b/(a^2+b^2)^2/(a+b*cot(d*x+c))^(1/2)*a^2+1
/4/d*b^5/(a^2+b^2)^(7/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^
(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+3/d*b/(
a^2+b^2)^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1
/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4-5/d*b^3/(a
^2+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2
)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3-1/4/d*b
^5/(a^2+b^2)^(7/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1
/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-1/d*b^5/(a^2+
b^2)^3/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-
2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))+2/d*b/(a^2+b^2)^(5
```

```
/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+
b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^3+1/d/b/(a^2+b^2)^(
7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2
+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^7+1/4/d/b/(a^2+b^2
)^(7/2)*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c
)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^6-2/d*b^3/(a^2+b^2)^3/
(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)
^(1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2+3/4/d*b^3/(a^2+b^2)^3
*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^
2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-3/4/d*b^3/(a^2+b^2)^3*ln(b*co
t(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(
1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a-5/4/d*b^3/(a^2+b^2)^(7/2)*ln((a+b*cot
(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2)
)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2-3/d*b^3/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(1
/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/
2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a+3/d*b^3/(a^2+b^2)^(5/2)/(2*(a^2+b^2)^(
1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1
/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a+5/4/d*b^3/(a^2+b^2)^(7/2)*ln(b*cot(d*
x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2)
)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^2+1/4/d/b/(a^2+b^2)^3*ln(b*cot(d*x+c)+a+(
a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)+(a^2+b^2)^(1/2))*(2*(a^
2+b^2)^(1/2)+2*a)^(1/2)*a^5-1/4/d/b/(a^2+b^2)^3*ln((a+b*cot(d*x+c))^(1/2)*(
2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(
1/2)+2*a)^(1/2)*a^5-3/d*b/(a^2+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arc
tan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(
1/2)-2*a)^(1/2))*a^5-7/d*b^5/(a^2+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*
arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1/2)+2*a)^(1/2))/(2*(a^2+b^2
)^(1/2)-2*a)^(1/2))*a+5/d*b^3/(a^2+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)
*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^
2)^(1/2)-2*a)^(1/2))*a^3-1/d/b/(a^2+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2
)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b
^2)^(1/2)-2*a)^(1/2))*a^7+7/d*b^5/(a^2+b^2)^(7/2)/(2*(a^2+b^2)^(1/2)-2*a)^(
1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*cot(d*x+c))^(1/2))/(2*(a^
2+b^2)^(1/2)-2*a)^(1/2))*a-5/4/d*b/(a^2+b^2)^(7/2)*ln((a+b*cot(d*x+c))^(1/2
)*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2
)^(1/2)+2*a)^(1/2)*a^4+1/2/d*b/(a^2+b^2)^3*ln((a+b*cot(d*x+c))^(1/2)*(2*(a^
2+b^2)^(1/2)+2*a)^(1/2)-b*cot(d*x+c)-a-(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+
2*a)^(1/2)*a^3-4/3*a*b/(a^2+b^2)/d/(a+b*cot(d*x+c))^(3/2)+1/d/b/(a^2+b^2)^(
5/2)/(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*
(a+b*cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^5-1/4/d/b/(a^2+b^2
)^(7/2)*ln(b*cot(d*x+c)+a+(a+b*cot(d*x+c))^(1/2)*(2*(a^2+b^2)^(1/2)+2*a)^(1
/2)+(a^2+b^2)^(1/2))*(2*(a^2+b^2)^(1/2)+2*a)^(1/2)*a^6+2/d*b^3/(a^2+b^2)^3/
(2*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan(((2*(a^2+b^2)^(1/2)+2*a)^(1/2)-2*(a+b*
cot(d*x+c))^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^2-3/d*b/(a^2+b^2)^3/(2*
(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(1
```

```
/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^4-1/d/b/(a^2+b^2)^(5/2)/(2
*(a^2+b^2)^(1/2)-2*a)^(1/2)*arctan((2*(a+b*cot(d*x+c))^(1/2)+(2*(a^2+b^2)^(
1/2)+2*a)^(1/2))/(2*(a^2+b^2)^(1/2)-2*a)^(1/2))*a^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\cot(dx+c)-a}{(b\cot(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*cot(d*x + c) - a)/(b*cot(d*x + c) + a)^(5/2), x)
```

mupad [B] time = 16.17, size = 8438, normalized size = 48.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(-(a - b*cot(c + d*x))/(a + b*cot(c + d*x))^(5/2),x)
```

```
[Out] (log(((-(4*a^7*d^2 - (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4
+ 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2
*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^
4 + 5*a^8*b^2*d^4))^(1/2)*((a + b*cot(c + d*x))^(1/2)*(320*a^6*b^14*d^3 - 1
6*a^2*b^18*d^3 + 1024*a^8*b^12*d^3 + 1440*a^10*b^10*d^3 + 1024*a^12*b^8*d^3
 + 320*a^14*b^6*d^3 - 16*a^18*b^2*d^3) - ((-(4*a^7*d^2 - (320*a^6*b^8*d^4 -
 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)
^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*
d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(((-(4*a^7*d^
2 - (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d
^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 +
 b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4
))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 288
0*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d
^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19
*b^4*d^5 + 64*a^21*b^2*d^5))/4 - 32*a*b^21*d^4 - 160*a^3*b^19*d^4 - 128*a^5
*b^17*d^4 + 896*a^7*b^15*d^4 + 3136*a^9*b^13*d^4 + 4928*a^11*b^11*d^4 + 448
0*a^13*b^9*d^4 + 2432*a^15*b^7*d^4 + 736*a^17*b^5*d^4 + 96*a^19*b^3*d^4))/4
))/4 + 16*a^4*b^15*d^2 + 96*a^6*b^13*d^2 + 240*a^8*b^11*d^2 + 320*a^10*b^9*
d^2 + 240*a^12*b^7*d^2 + 96*a^14*b^5*d^2 + 16*a^16*b^3*d^2)*(-(4*a^7*d^2 -
(320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 -
 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 + b^1
0*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(
```

```
1/2))/4 - log(16*a^4*b^15*d^2 - (-(4*a^7*d^2 - (320*a^6*b^8*d^4 - 16*a^4*b^
10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 2
0*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4
 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*((a + b*cot(c
 + d*x))^(1/2)*(320*a^6*b^14*d^3 - 16*a^2*b^18*d^3 + 1024*a^8*b^12*d^3 + 14
40*a^10*b^10*d^3 + 1024*a^12*b^8*d^3 + 320*a^14*b^6*d^3 - 16*a^18*b^2*d^3)
+ (-(4*a^7*d^2 - (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 16
00*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2
)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b
^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(896*a^7*b^15*d^4 - (-(4*a^7*d^2 - (320*a^6
*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^1
2*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*
d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))
^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*
a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5
 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b
^4*d^5 + 64*a^21*b^2*d^5) - 160*a^3*b^19*d^4 - 128*a^5*b^17*d^4 - 32*a*b^21
*d^4 + 3136*a^9*b^13*d^4 + 4928*a^11*b^11*d^4 + 4480*a^13*b^9*d^4 + 2432*a^
15*b^7*d^4 + 736*a^17*b^5*d^4 + 96*a^19*b^3*d^4)) + 96*a^6*b^13*d^2 + 240*a
^8*b^11*d^2 + 320*a^10*b^9*d^2 + 240*a^12*b^7*d^2 + 96*a^14*b^5*d^2 + 16*a^
16*b^3*d^2)*(-(4*a^7*d^2 - (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^
6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a
^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 +
 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) + (log(((((320*a^2*b^12*d^4 - 16*
b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) +
20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2
*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(((((320
*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^
8*b^6*d^4)^(1/2) + 20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(a^10*d^4
 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d
^4))^(1/2)*(96*a*b^21*d^4 + 736*a^3*b^19*d^4 + 2432*a^5*b^17*d^4 + 4480*a^7
*b^15*d^4 + 4928*a^9*b^13*d^4 + 3136*a^11*b^11*d^4 + 896*a^13*b^9*d^4 - 128
*a^15*b^7*d^4 - 160*a^17*b^5*d^4 - 32*a^19*b^3*d^4 - ((((320*a^2*b^12*d^4 -
 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2
) + 20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5
*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(a +
 b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^
5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^
13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64
*a^21*b^2*d^5))/4))/4 - (a + b*cot(c + d*x))^(1/2)*(320*a^4*b^16*d^3 - 16*b
^20*d^3 + 1024*a^6*b^14*d^3 + 1440*a^8*b^12*d^3 + 1024*a^10*b^10*d^3 + 320*
a^12*b^8*d^3 - 16*a^16*b^4*d^3)))/4 - 8*b^19*d^2 - 40*a^2*b^17*d^2 - 72*a^4
*b^15*d^2 - 40*a^6*b^13*d^2 + 40*a^8*b^11*d^2 + 72*a^10*b^9*d^2 + 40*a^12*b
^7*d^2 + 8*a^14*b^5*d^2)*(((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*
d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) + 20*a*b^6*d^2 - 40*a^3*b^4
```

*d^2 + 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 + (log(((-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(((-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(96*a*b^21*d^4 + 736*a^3*b^19*d^4 + 2432*a^5*b^17*d^4 + 4480*a^7*b^15*d^4 + 4928*a^9*b^13*d^4 + 3136*a^11*b^11*d^4 + 896*a^13*b^9*d^4 - 128*a^15*b^7*d^4 - 160*a^17*b^5*d^4 - 32*a^19*b^3*d^4 - ((-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5))/4))/4 - (a + b*cot(c + d*x))^(1/2)*(320*a^4*b^16*d^3 - 16*b^20*d^3 + 1024*a^6*b^14*d^3 + 1440*a^8*b^12*d^3 + 1024*a^10*b^10*d^3 + 320*a^12*b^8*d^3 - 16*a^16*b^4*d^3)))/4 - 8*b^19*d^2 - 40*a^2*b^17*d^2 - 72*a^4*b^15*d^2 - 40*a^6*b^13*d^2 + 40*a^8*b^11*d^2 + 72*a^10*b^9*d^2 + 40*a^12*b^7*d^2 + 8*a^14*b^5*d^2)*(-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 - log((((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) + 20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*((((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) + 20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(96*a*b^21*d^4 + 736*a^3*b^19*d^4 + 2432*a^5*b^17*d^4 + 4480*a^7*b^15*d^4 + 4928*a^9*b^13*d^4 + 3136*a^11*b^11*d^4 + 896*a^13*b^9*d^4 - 128*a^15*b^7*d^4 - 160*a^17*b^5*d^4 - 32*a^19*b^3*d^4 + (((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) + 20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5)) + (a + b*cot(c + d*x))^(1/2)*(320*a^4*b^16*d^3 - 16*b^20*d^3 + 1024*a^6*b^14*d^3 + 1440*a^8*b^12*d^3 + 1024*a^10*b^10*d^3 + 320*a^12*b^8*d^3 - 16*a^16*b^4*d^3)) - 8*b^19*d^2 - 40*a^2*b^17*d^2 - 72*a^4*b^15*d^2 - 40*a^6*b^13*d^2 + 40*a^8*b^11*d^2 + 72*a^10*b^9*d^2 + 40*a^12*b^7*d^2 + 8*a^14*b^5*d^2)*(((320*a^2*b^12*d^4 - 1

6*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) + 20*a*b^6*d^2 - 40*a^3*b^4*d^2 + 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) - log((-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*((-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(96*a*b^21*d^4 + 736*a^3*b^19*d^4 + 2432*a^5*b^17*d^4 + 4480*a^7*b^15*d^4 + 4928*a^9*b^13*d^4 + 3136*a^11*b^11*d^4 + 896*a^13*b^9*d^4 - 128*a^15*b^7*d^4 - 160*a^17*b^5*d^4 - 32*a^19*b^3*d^4 + (-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2)*(a + b*cot(c + d*x))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5)) + (a + b*cot(c + d*x))^(1/2)*(320*a^4*b^16*d^3 - 16*b^20*d^3 + 1024*a^6*b^14*d^3 + 1440*a^8*b^12*d^3 + 1024*a^10*b^10*d^3 + 320*a^12*b^8*d^3 - 16*a^16*b^4*d^3)) - 8*b^19*d^2 - 40*a^2*b^17*d^2 - 72*a^4*b^15*d^2 - 40*a^6*b^13*d^2 + 40*a^8*b^11*d^2 + 72*a^10*b^9*d^2 + 40*a^12*b^7*d^2 + 8*a^14*b^5*d^2)*(-((320*a^2*b^12*d^4 - 16*b^14*d^4 - 1760*a^4*b^10*d^4 + 1600*a^6*b^8*d^4 - 400*a^8*b^6*d^4)^(1/2) - 20*a*b^6*d^2 + 40*a^3*b^4*d^2 - 4*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1/2) + (log(16*a^4*b^15*d^2 - ((((-(4*a^7*d^2 + (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(((a + b*cot(c + d*x))^(1/2)*(-(4*a^7*d^2 + (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 7680*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5))/4 - 32*a*b^21*d^4 - 160*a^3*b^19*d^4 - 128*a^5*b^17*d^4 + 896*a^7*b^15*d^4 + 3136*a^9*b^13*d^4 + 4928*a^11*b^11*d^4 + 4480*a^13*b^9*d^4 + 2432*a^15*b^7*d^4 + 736*a^17*b^5*d^4 + 96*a^19*b^3*d^4))/4 - (a + b*cot(c + d*x))^(1/2)*(320*a^6*b^14*d^3 - 16*a^2*b^18*d^3 + 1024*a^8*b^12*d^3 + 1440*a^10*b^10*d^3 + 1024*a^12*b^8*d^3 + 320*a^14*b^6*d^3 - 16*a^18*b^2*d^3))*(-(4*a^7*d^2 + (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 + 96*a^6*b^13*d

```
^2 + 240*a^8*b^11*d^2 + 320*a^10*b^9*d^2 + 240*a^12*b^7*d^2 + 96*a^14*b^5*d
^2 + 16*a^16*b^3*d^2)*(-(4*a^7*d^2 + (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1
760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*
d^2 - 40*a^5*b^2*d^2)/(a^10*d^4 + b^10*d^4 + 5*a^2*b^8*d^4 + 10*a^4*b^6*d^4
 + 10*a^6*b^4*d^4 + 5*a^8*b^2*d^4))^(1/2))/4 - log(16*a^4*b^15*d^2 - ((-(4*
a^7*d^2 + (320*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10
*b^4*d^4 - 400*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(16*a
^10*d^4 + 16*b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4
+ 80*a^8*b^2*d^4))^(1/2)*(896*a^7*b^15*d^4 - 32*a*b^21*d^4 - 160*a^3*b^19*d
^4 - 128*a^5*b^17*d^4 - (a + b*cot(c + d*x))^(1/2)*(-(4*a^7*d^2 + (320*a^6*
b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12
*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d
^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^
(1/2)*(64*a*b^22*d^5 + 640*a^3*b^20*d^5 + 2880*a^5*b^18*d^5 + 7680*a^7*b^16
*d^5 + 13440*a^9*b^14*d^5 + 16128*a^11*b^12*d^5 + 13440*a^13*b^10*d^5 + 768
0*a^15*b^8*d^5 + 2880*a^17*b^6*d^5 + 640*a^19*b^4*d^5 + 64*a^21*b^2*d^5) +
3136*a^9*b^13*d^4 + 4928*a^11*b^11*d^4 + 4480*a^13*b^9*d^4 + 2432*a^15*b^7*
d^4 + 736*a^17*b^5*d^4 + 96*a^19*b^3*d^4) + (a + b*cot(c + d*x))^(1/2)*(320
*a^6*b^14*d^3 - 16*a^2*b^18*d^3 + 1024*a^8*b^12*d^3 + 1440*a^10*b^10*d^3 +
1024*a^12*b^8*d^3 + 320*a^14*b^6*d^3 - 16*a^18*b^2*d^3))*(-(4*a^7*d^2 + (32
0*a^6*b^8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 40
0*a^12*b^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(16*a^10*d^4 + 16*
b^10*d^4 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*
d^4))^(1/2) + 96*a^6*b^13*d^2 + 240*a^8*b^11*d^2 + 320*a^10*b^9*d^2 + 240*a
^12*b^7*d^2 + 96*a^14*b^5*d^2 + 16*a^16*b^3*d^2)*(-(4*a^7*d^2 + (320*a^6*b^
8*d^4 - 16*a^4*b^10*d^4 - 1760*a^8*b^6*d^4 + 1600*a^10*b^4*d^4 - 400*a^12*b
^2*d^4)^(1/2) + 20*a^3*b^4*d^2 - 40*a^5*b^2*d^2)/(16*a^10*d^4 + 16*b^10*d^4
 + 80*a^2*b^8*d^4 + 160*a^4*b^6*d^4 + 160*a^6*b^4*d^4 + 80*a^8*b^2*d^4))^(1
/2) - ((2*a*b)/(3*(a^2 + b^2)) + (2*b*(a^2 - b^2)*(a + b*cot(c + d*x)))/(a^
2 + b^2)^2)/(d*(a + b*cot(c + d*x))^(3/2)) - ((2*a*b)/(3*(a^2 + b^2)) + (4*
a^2*b*(a + b*cot(c + d*x)))/(a^2 + b^2)^2)/(d*(a + b*cot(c + d*x))^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\int \frac{a}{a^2\sqrt{a+b\cot(c+dx)}+2ab\sqrt{a+b\cot(c+dx)}\cot(c+dx)+b^2\sqrt{a+b\cot(c+dx)}\cot^2(c+dx)}\,dx-\int\Big(-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*cot(d*x+c))/(a+b*cot(d*x+c))**(5/2),x)
```

```
[Out] -Integral(a/(a**2*sqrt(a + b*cot(c + d*x)) + 2*a*b*sqrt(a + b*cot(c + d*x))
*cot(c + d*x) + b**2*sqrt(a + b*cot(c + d*x))*cot(c + d*x)**2), x) - Integr
al(-b*cot(c + d*x)/(a**2*sqrt(a + b*cot(c + d*x)) + 2*a*b*sqrt(a + b*cot(c
+ d*x))*cot(c + d*x) + b**2*sqrt(a + b*cot(c + d*x))*cot(c + d*x)**2), x)
```

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

debug=False;

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

def is_sqrt(expr):
    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):

    debug=False
    if debug: print ("Enter is_atom")


    #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):

    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):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(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"
```